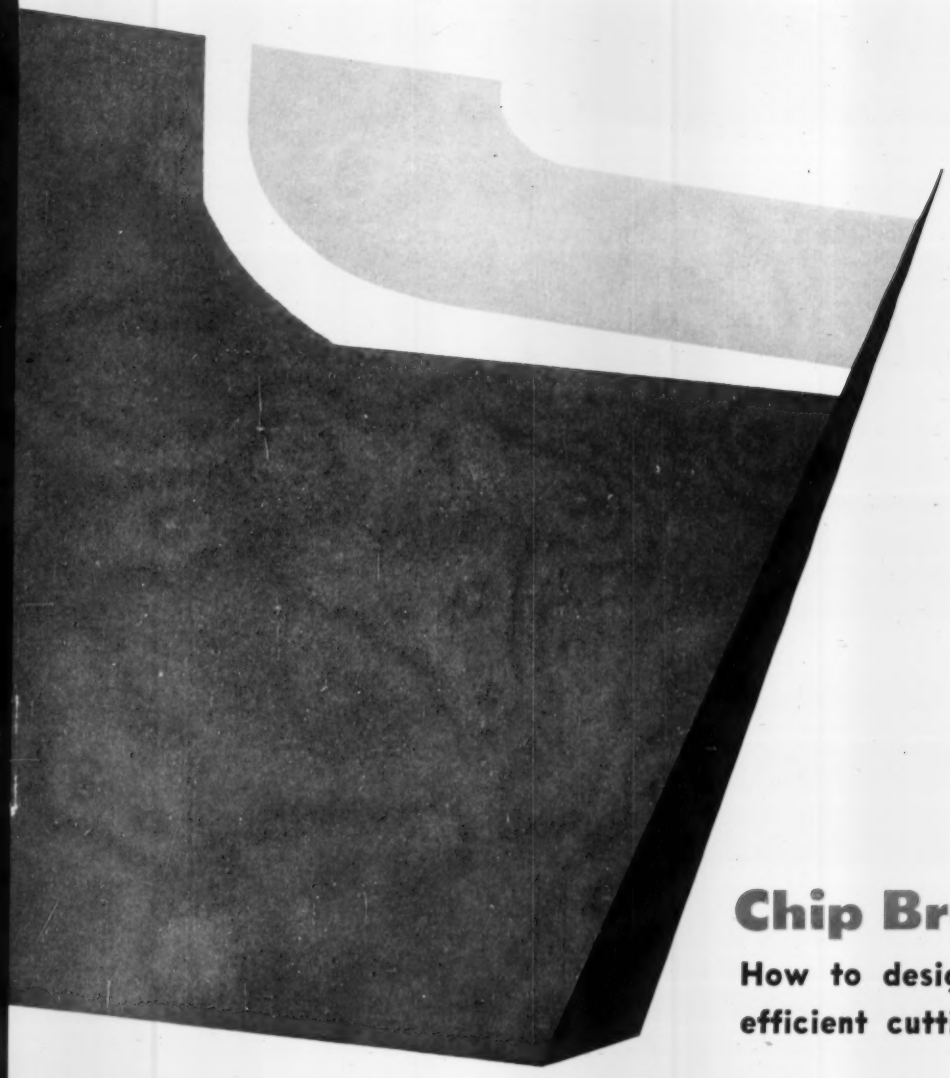
APRIL 26, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



Chip Breakers

How to design them for efficient cutting

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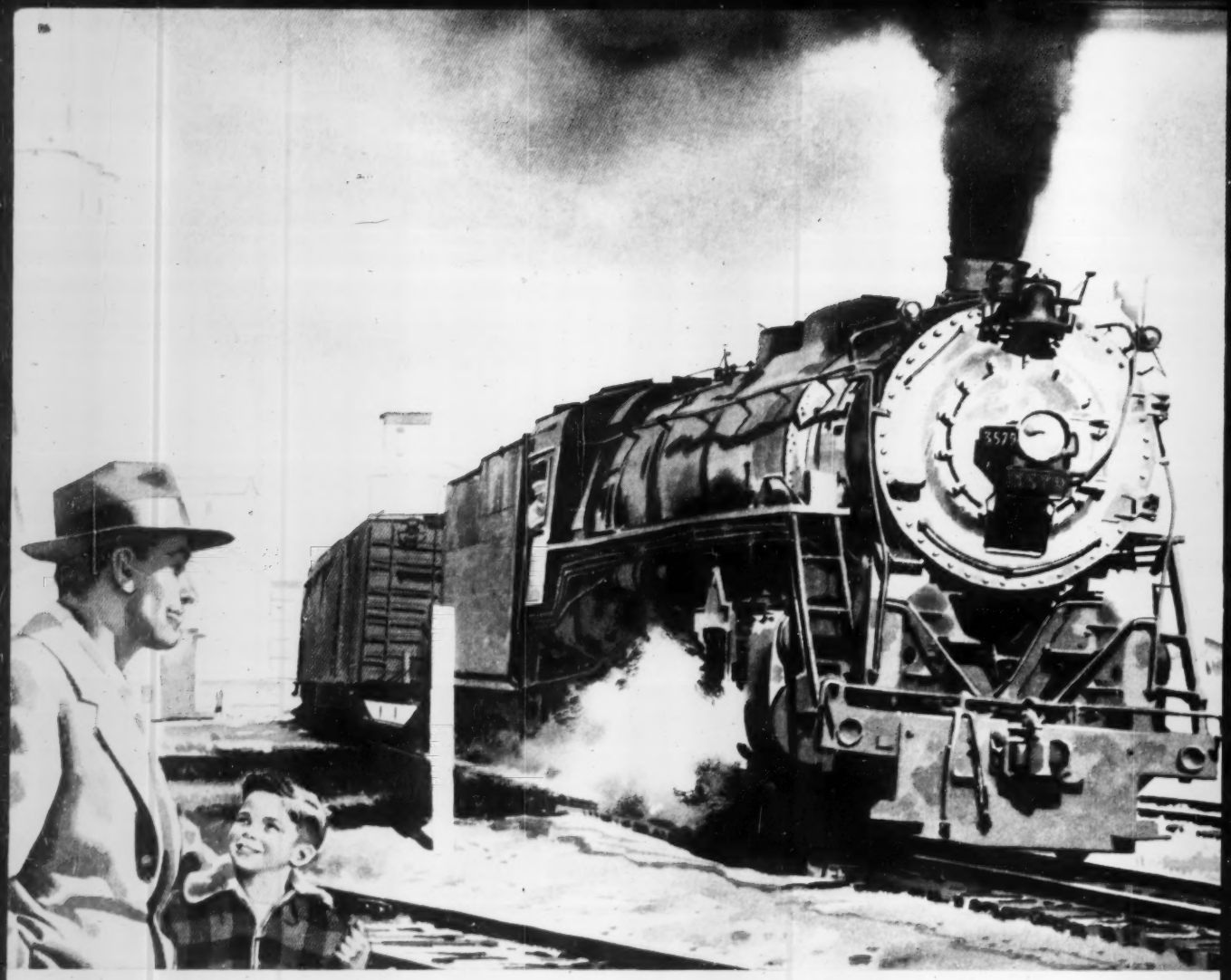

Look, Daddy—a steam engine!

THAT'S right. Kind of a rare sight these days. Looks like the good old "iron horse" is headed for the last round-up.

Why? Competition mostly. Something *better* came along. Locomotives that were more efficient—less costly to operate and maintain. That's the way it goes. Competition means progress for some things, obsolescence for others.

Naturally you want *your product* to be a success in the competitive days ahead. So you're probably looking right now for new ways to improve quality and cut production costs. That's where we here at Heald may be able to help. New Heald developments in automation, battery-type equipment, way-type and transfer-type Bore-Matics, plus a number of advanced design features, can now be applied to a wide variety of jobs. We'd like to show you what a fresh Heald viewpoint and latest Heald equipment can do—on long or short runs, single or multi-purpose setups.

Competition is wonderful when you're *ahead* of it. Our business is to keep you there. That's why IT PAYS TO COME TO HEALD.

HEALD

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton
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Internal and Rotary Surface Grinding Machines and Bore-Matics

MAYARI R

IS EASY TO WELD

One of the special advantages of Mayari R is that you can weld it by all the usual methods. The development of this high-strength, low-alloy steel closely followed the development of welding itself, and great care was taken to make Mayari R easy to weld. Its low carbon content of .12 max insures maximum weldability.

Whether you weld Mayari R by the electric-resistance, automatic-submerged-arc, electric-arc, or gas-welding process, you can use the same general procedures as you would with ordinary structural steel. No need for special equipment, and good welding speeds can be maintained.

Classed as a non-air-hardening steel, Mayari R shows no appreciable hardening from usual welding temperatures. For the general run of welding operations, no preheat or postheat is required. As with ordinary carbon steels, assemblies or structures subject to fatigue, dynamic stresses or severe impact should be stress-relieved after welding.

If you have some special questions on the welding of Mayari R, let us hear from you. And for your files, you should have our Mayari R Catalog 55. Phone or write the nearest Bethlehem office for a copy.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Mayari R *makes it lighter... stronger... longer lasting*

CARBURIZING

Faster . . . Less distortion . . . Closer depth control . . . Selective heating . . . Reheating operation eliminated . . . No "oxygenation" of the case . . . Carburizing can easily be combined with martempering or brazing.

HARDENING

Complete protection of work against pitting, scaling, carburizing or decarburizing . . . Heating cycles 4 to 6 times faster . . . Low operating and maintenance costs . . . First cost of equipment materially less.

ALUMINUM HEAT TREATING

More production in less time . . . Faster, more uniform heating . . . Simplified quenching . . . Minimum warpage . . . Real protection to product by molten salt . . . Clean . . . No skilled labor needed.

PROCESS ANNEALING

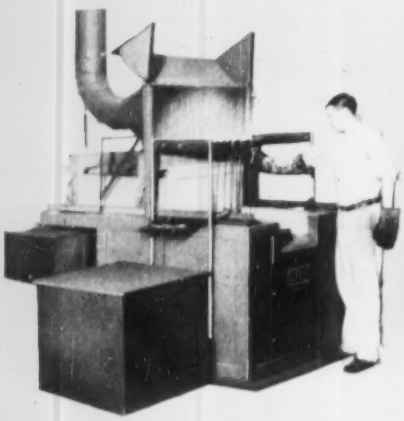
No scale, decarburization or other surface effects . . . Annealing cycles reduced from hours to minutes . . . Great savings in floor space . . . 50% lower first cost of equipment.

CYANIDING

Large production in less space from smaller equipment . . . Minimum distortion . . . Higher and more uniform surface hardness of the finished product assures superior impact fatigue life.

CLEANING—DESCALING

Handles more work with less labor . . . Less floor space . . . Less time . . . Different metals and shapes can be cleaned or descaled simultaneously . . . Uniform cleaning does not affect base metal.



SAVE WITH HEAT TREATING!

Note these typical advantages

MARTEMPERING and AUSTEMPERING

No oil quenches required . . . Negligible distortion cuts costs by permitting machine finishing before hardening . . . Scale, decarb and quench cracks eliminated . . . Toughness and ductility are increased.

BRAZING

Work can be immersed in batches for maximum speed and economy . . . All joints brazed simultaneously in seconds . . . No decarburization of steel assemblies . . . No cooling chamber needed . . . Can be simply combined with carburizing or hardening.

Write today for your copy of this 72-page Ajax Salt Bath Catalog 116B — NEW EDITION.

AJAX ELECTRIC COMPANY
952 Frankford Avenue, Philadelphia 23, Pa.
Associate companies: Ajax Electric Furnace Corp., Ajax Engineering Corp., Ajax Electrothermic Corp.

HULTGREN

World's largest manufacturer of electric heat-treating furnaces exclusively

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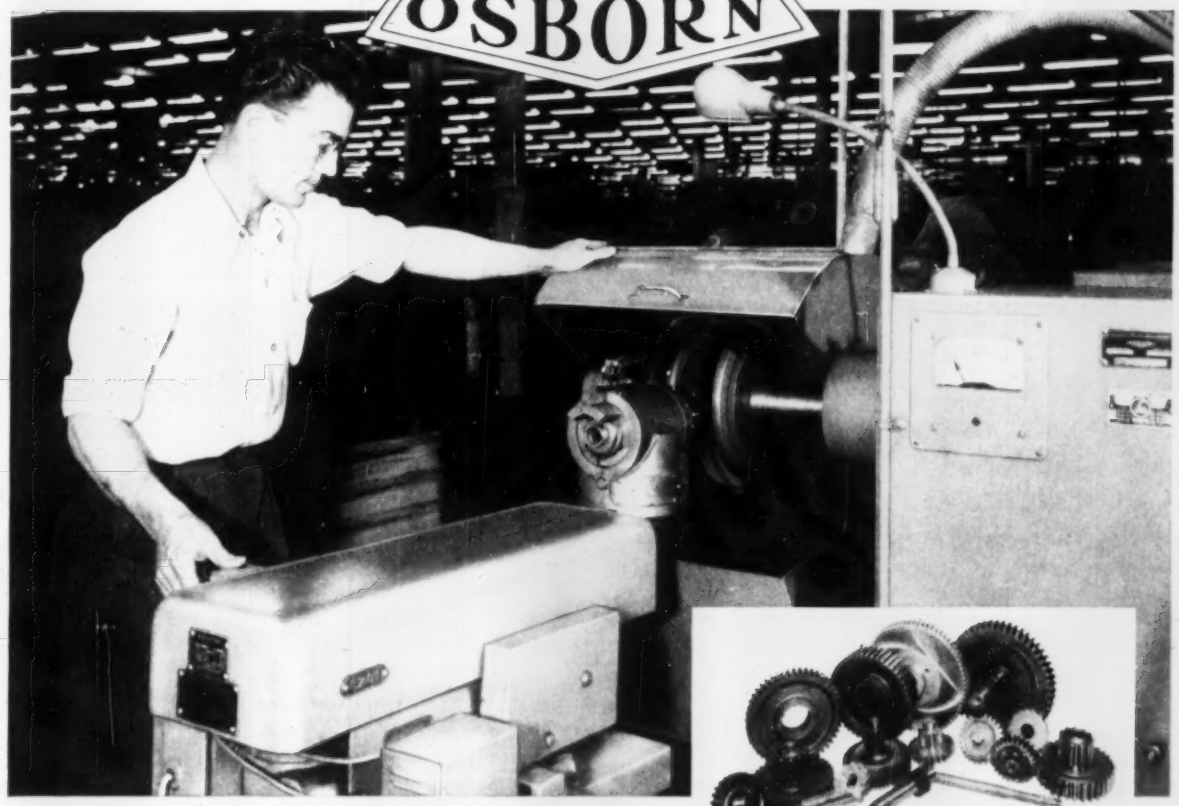


Blends surface junctures... saves over 1000 manhours

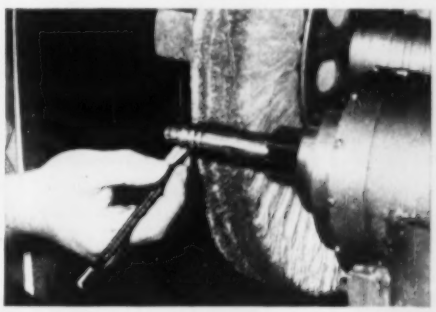
...Power brushing with the Osborn *Brushamatic** shown above replaced hand methods on a job of burr removal and finishing 17 different gears for material handling trucks. Net saving is over 1000 production hours a year per machine. Moreover, *quality* and uniformity of gears are greatly improved.

The operator simply pushes a button and the *Brushamatic* goes through a complete cycle to remove burrs and feather edges, and *blend* surface junctures *automatically.*

Users of *Brushamatic* machines are improving quality and increasing output as much as 500% over hand methods. Find out how your **O**sborn **B**rushing **A**nalyst can help *you* cut costs, improve quality and boost production. Call your **OBA,** or write *The Osborn Manufacturing Company, Dept. G-18, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

*Trade-Mark

Brushamatics can be preset to desired time cycle for accurate duplication and uniformity of results. Above: Group of completed parts. Below: Threaded shaft set up for microfinishing.



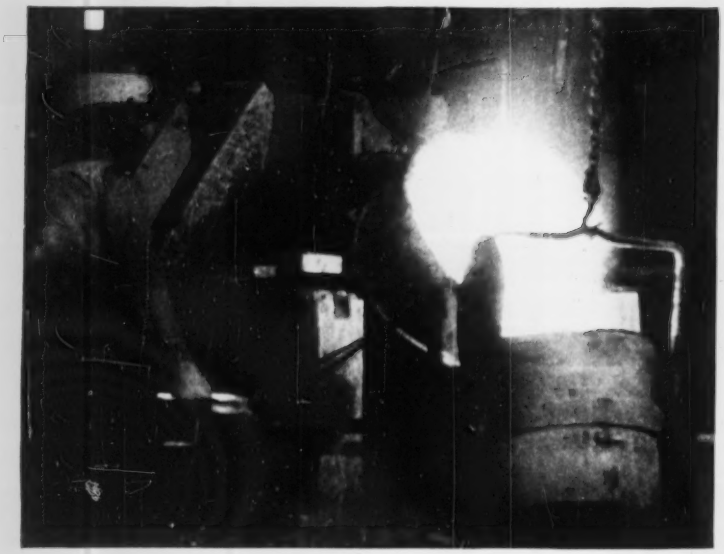
INFORMATION: *Write today for your copies of Booklets on Automatic Deburring and on Brushamatic Machines.*

See it at Osborn Booth 627, ASTE Show

Osborn Brushamatic

BETTER QUALITY... LOWER COSTS... AT THE PUSH OF A BUTTON

about Radiant foundry coke



Speeds melting!

HIGH CARBON PICKUP

You get *hotter and faster* melting and *high carbon pickup* in the cupola with TENNESSEE Radiant Foundry Coke. Check these properties:

High Carbon (above 90%)
Low ash (below 8%)
Low sulphur (below 0.60%)
Low volatile matter (below 1%)
Low porosity (below 49)

HIGH SHATTER TEST

And you make less breeze with this foundry grade coke because of its *large size* and *toughness*. Has "shatter test" above 95%, on 2" screen.

TENNESSEE'S rigid controls assure *high uniformity* in both chemical and physical analyses of this high quality coke. Made in by-product ovens at Chattanooga, Tenn.

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Send complete information on Radiant Foundry Coke.

Name
Position
Company
Address
City State

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PRODUCTS & CHEMICAL
Corporation
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Producers of: FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING PRODUCTS • AROMATIC CHEMICALS • WOOD CHEMICALS • AGRICULTURAL CHEMICALS

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 17 April 26, 1954

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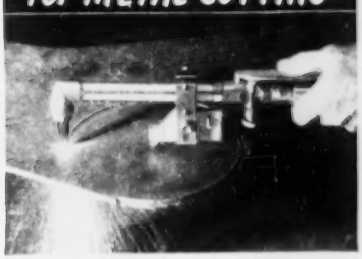
THREE NEW GUIDES for METAL CUTTING



Now you can accurately, easily flame cut all kinds of shapes—circles, angles, bevels, straight lines. NEECO cutting guides convert ordinary hand torches into precision cutting instruments. Attached quickly—without tools. Neat, clean cuts need little or no grinding or machine finishing. Models to fit all torches, from 70 to 90 types. Cut circles from 1 to 66 inches diameter. Every shop should have these new guides—as base, time saving tools or as standby equipment.

The new NEECO guides are of three types—for small circles (shown above), for large circles, and for straight lines.

Write for illustrated Bulletin 101 and model selection data.

NEECO Precision Flame Cutting —Fast and Exact!

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458 West 29th St., Chicago 16, Illinois

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City State

behind the scenes

Babies Bring Business

We saw an advertisement in *Saturday Evening Post* the other day prepared by J. Walter Thompson, one of the world's biggest advertising agencies. It had this very stimulating headline: "These exciting changes bring new opportunities to American business everywhere."

The ad went on to detail these very dramatic and significant points:

(1) Big families are back in style. Today more couples are having three, four, five—even six children. Every nine seconds a baby is born.

(2) Each month we are adding the equivalent of an Omaha, Nebr., to our population. The nation averages an increase of 225,000 persons every month.

(3) Over half our families are "new." Of the estimated 37 million married couples living together in 1953, more than 22 million married after 1940.

(4) There are four times as many Americans over 65 as in 1900—more than 13 million now versus 3 million then. By 1975, 20 million will be over 65.

(5) Thirty-one-million people will move this year. Families are moving to better homes . . . from cities to suburbs . . . from one section of the country to another.

Looks to us like what J. Walter Thompson is attempting to say is that "babies bring business;" that there's a powerful lot of demand for your products being built up in the growing needs of a growing U.S.A.

Oophs! There goes son #2. Must be time for that six o'clock feeding. See, even we are doing our bit for the future of American business.

Heavy Hand for Heavy Feet

A Boston father, John A. Letteney, has invented a gadget designed to keep Junior and the family buggy intact. You simply set a dial mounted on the car's instrument panel for any mile-per-hour ceiling you decide upon from zero to 60. Turn the key in the lock and it's mechanically impossible for anyone to push your bus beyond that limit until you change it.

There's a last spot on the dial marked "unlimited" if you really want to see what the baby will do with the accelerator snuggling the floorboards, but Junior never gets to use that.

Because it works through the ignition system, the car's pickup and climbing power are not affected until the set speed is reached. The Automotive Safety Speed Control Corp., manufacturer of the device, expects to hit the market with it sometime next month.

Although the gadget may appear to Junior to be a bit heavy-handed, we think it's a wonderful safety check on all of us with a tendency to be heavy-footed, fathers included.

Jack Benny, on Turning 40

Are you nearing your fortieth birthday? Well Jack Benny has a bit of sage advice for you calculated to keep you feeling thirty-nineish forever and ever. His words of wacky wisdom are quoted from an article in *Collier's*, Feb. 19, titled "After Thirty-nine Years, I'm Turning Forty."

We are discussing this subject here only because we know that the average age of STEEL readers is somewhere slightly *au gauche de* 40. There just might be a "second wind" here for some of us.

"Before your fortieth birthday," says Jack, "keep circulating that you're 39. If people hear it often enough, they'll believe it for years.

"When in the company of younger people, ask their advice on everything. Pretty soon they'll begin to believe they're older than you are.

"Stay slim. Thin people always look younger. Connie Mack is 91, but he's so slender nobody figures him to be more than 88.

"If you have to spend any money, do it grudgingly. People will think you are saving up for your old age instead of entering it. This rule won't cost you anything but a few friends, but you'll have so much money, you'll be ducking them anyway.

"Lastly, don't worry about your fortieth birthday. Remember, it will soon be over and it will never happen again."

Shrdlu

(Metalworking Outlook—Page 47)

1854-1954

WILLIAMS-WHITE . . . Builders *of Quality Machinery for 100 Years!*

REPRESENTATIVES

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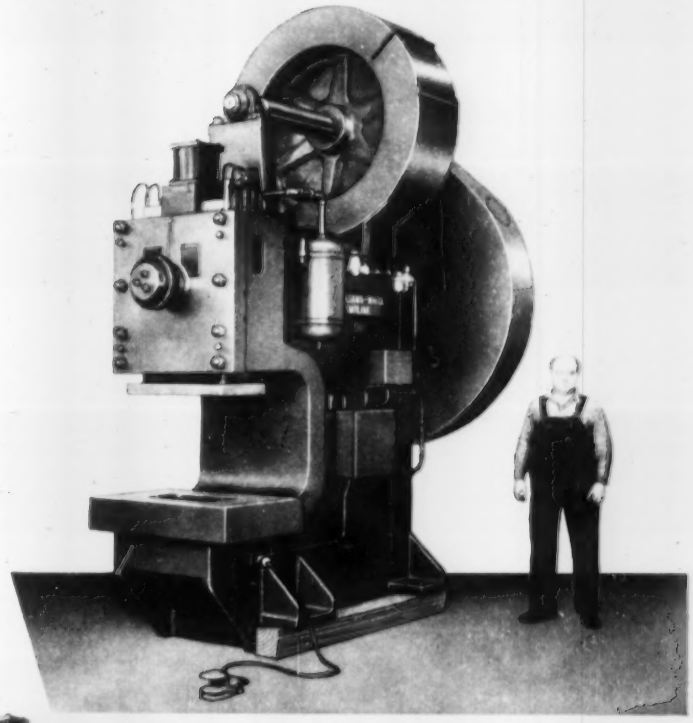

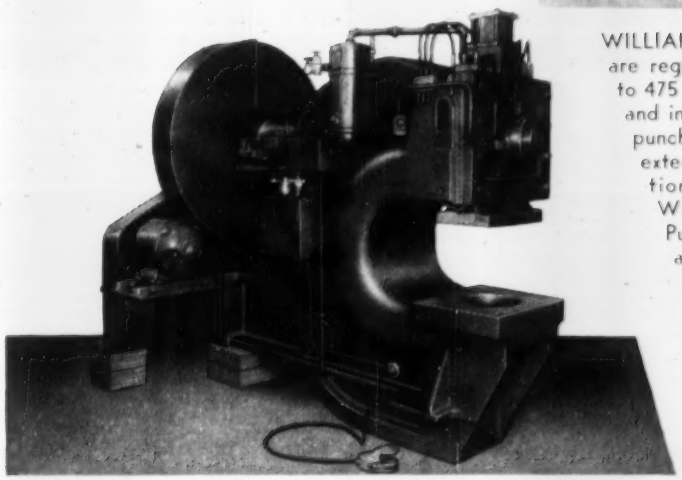

WILLIAMS-WHITE C-Frame Punches and Shears are regularly built in capacities ranging from 30 to 475 tons, with throats from 8 to 60 inches deep and in single or double end type. In addition to punching and shearing, these machines are used extensively in blanking and forming operations. The machine illustrated above is a WILLIAMS-WHITE No. 11-P Single End Punch and Shear with welded steel frame and at left is No. 12 with semi-steel frame. Both have air operated jaw-type clutch and one-shot lubrication. See table for details.

See our Hydraulic Bulldozer Booth 1000 at the A. S. T. E. Exposition in Philadelphia Convention Center, Philadelphia, Pa., April 26 thorugh 30.

Number	11-P	12
Throat, inches	11	25
Capacity, tons	400	200
Stroke, inches	3 1/2	2
Die space, inches	20 3/8	16
Die space adjustment, inches	3/4	3/4

WILLIAMS-WHITE
MOLINE

A CENTURY IN MOLINE • 300 EIGHTH ST.

WILLIAMS-WHITE & CO.

MOLINE, ILLINOIS

THE DOOR TO BETTER PRODUCT *performance*

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You don't see the industrial wire cloth in every motor car and truck. But, it's there. In the small parts—to make them *big* in performance. In air cleaners, brake lining, oil and fuel strainers, and so on.

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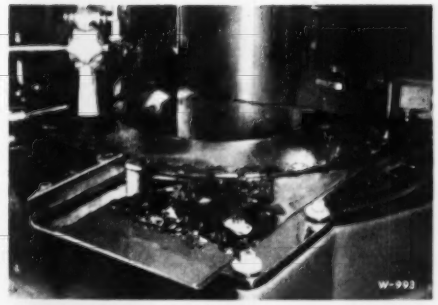
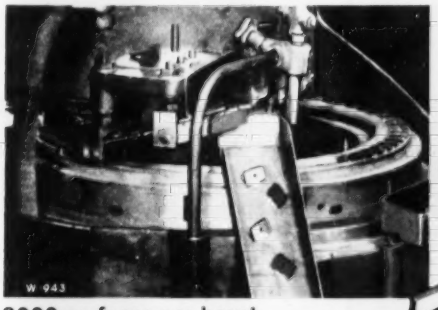
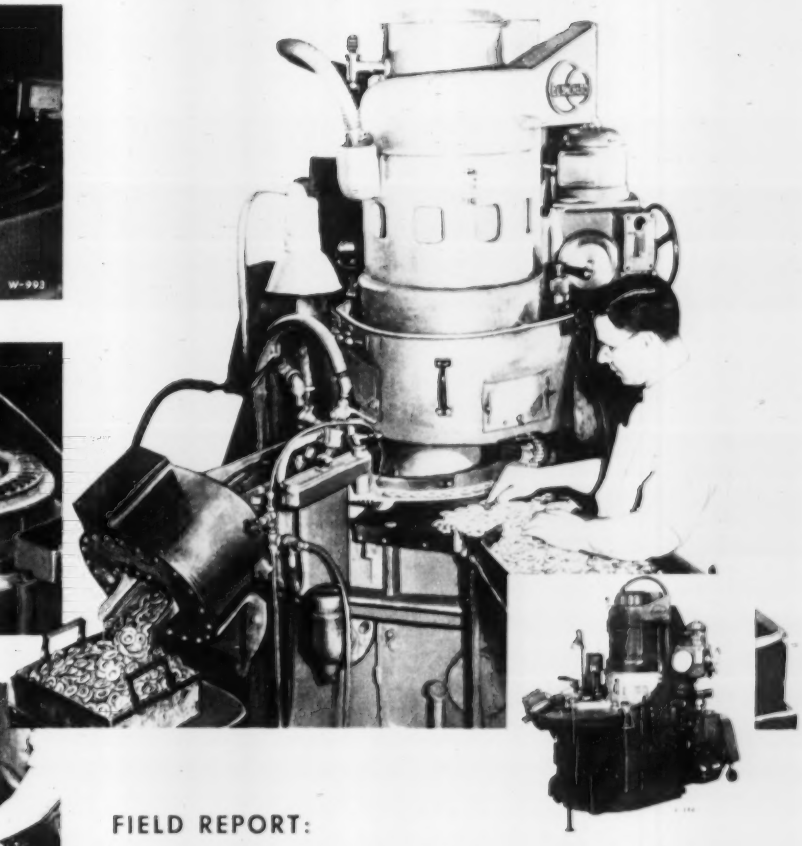
WORCESTER WIRE WORKS...*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes



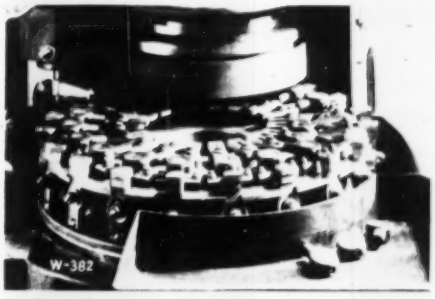
4360 surfaces per hour!



2000 surfaces per hour!



940 surfaces per hour!



900 surfaces per hour!

1400 surfaces per hour!

FIELD REPORT:

... a Blanchard No 16-A Surface Grinder saved them $39,000 in 2½ years! (cost approx $12,500) Other order follows for a Blanchard No 16-A2!

Here's proof of performance and proof of satisfaction, yet typical of what users expect *and get* from the Blanchard 16-A Surface Grinder. Several typical examples of production rates are shown here. Above, for instance, .003" of stock is being removed from one side of small gears to a tolerance of ±.001" *at a rate of 2100 per hour!* This machine has a 30" chuck and a Blanchard Demagnetizer.

The No. 16-A grinds continuously with a wheel that is set and automatically maintained at a fixed height above chuck face, and finishes one surface of the work to size in one pass under wheel. Operator has only to load the work on the magnetic chuck or in an automatic clamping fixture. A wheel control automatically feeds the head down to compensate for wheel wear. Unloading is usually automatic. Attachments can be supplied for demagnetizing and washing the work as it leaves the grinder. On most work, limits of ±.0005" are readily maintained.

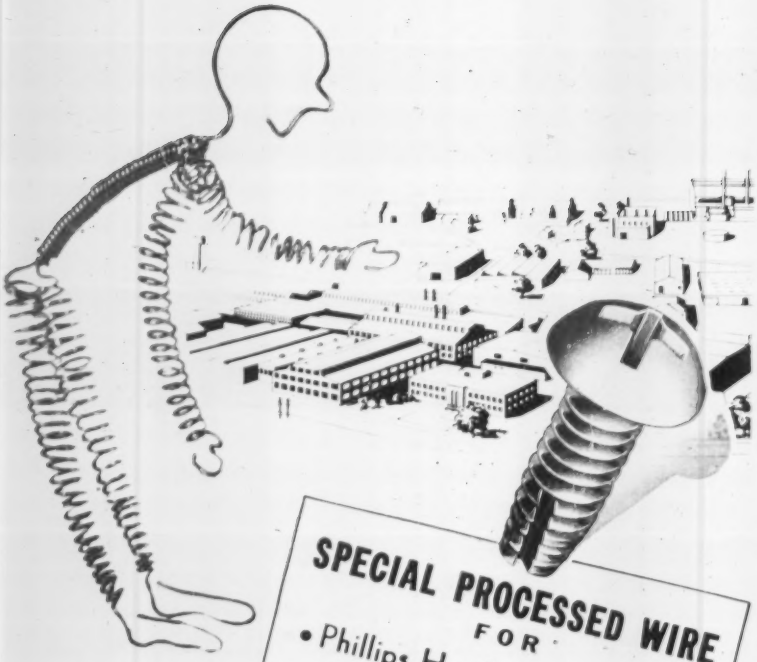
The No. 16-A2 (not shown) has two wheels, each with automatic size control. It roughs and finishes one surface of the work in one pass through the machine.

Send for your free copies of "Work Done on the Blanchard", fourth edition, and "Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE CO.

64 STATE ST., CAMBRIDGE 39, MASS., U. S. A.



PRODUCTION CAPACITY DOUBLED

To keep pace with the rapid increase in the use of recessed head screws, Keystone is doubling its capacity in the manufacture of "Special Processed" wire.

The unusual qualities of Special Processed Wire are recognized by licensed manufacturers of recessed head screws. This wire has also proved itself superior on many other difficult cold heading jobs.

Our additional capacity will enable us to meet the ever-increasing demand for "Special Processed" wire by our present customers and at the same time welcome new customers.

INDUSTRIAL WIRE SPECIALISTS

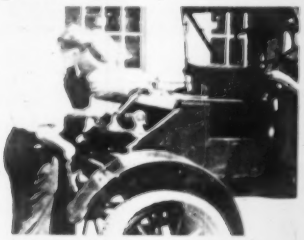
Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

LETTERS
TO THE EDITORS

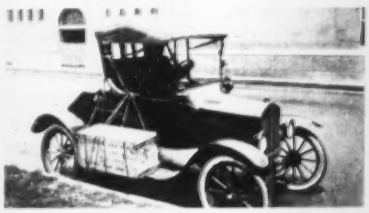
Selling in the Good Old Days

In your Mar. 22 issue I noticed the photograph on p. 80 showing a salesman who had developed the novel idea of displaying merchandise in the trunk of his car so that he could give a practical demonstration of his wares.

This is not a new idea, however (see the pictures taken in 1918). Potter Tool & Machine Works salesmen not only displayed the lathe mounted in a special trunk (very "modern" in its day) but



sold the extra lathe on the spot if the customer wished it (note the box tied to the running board).



John H. Hagan, president
Potter Tool & Machine Works Inc.
New York

Made in the U. S. A.

In your Feb. 22 issue an article appeared on "Fortiweld," a new steel of 80,000 psi tensile strength, "A Pinch of Boron Doubles Yield Point of Low-Carbon Steel" (p. 107). I would appreciate knowing if this steel is now manufactured in the U. S. and if so, by whom.

W. R. Romance
Euclid Division
General Motors Corp.
Cleveland

• *It is, by Kaiser Steel Corp., Fontana, Calif.—ED.*

Help for Jobless Communities

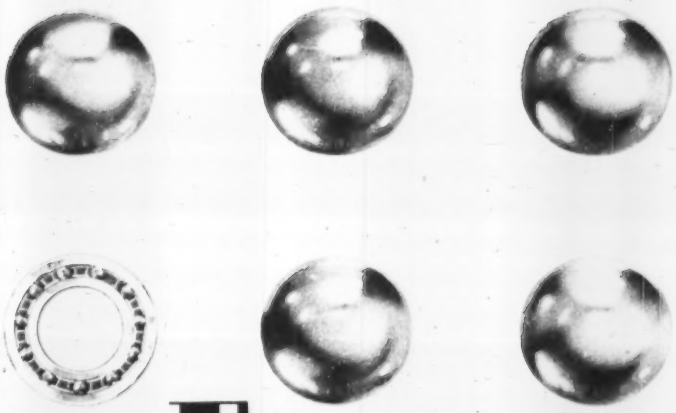
Please send me a few copies of your interesting article "Reversing the Jobless Trend by Your Own Bootstraps" (Mar. 8, p. 74). I am certain this article would stir some action in my community. I thank you for this information.

Lawrence D. M. Hall
71 Woodrow St.
Lyndora, Pa.

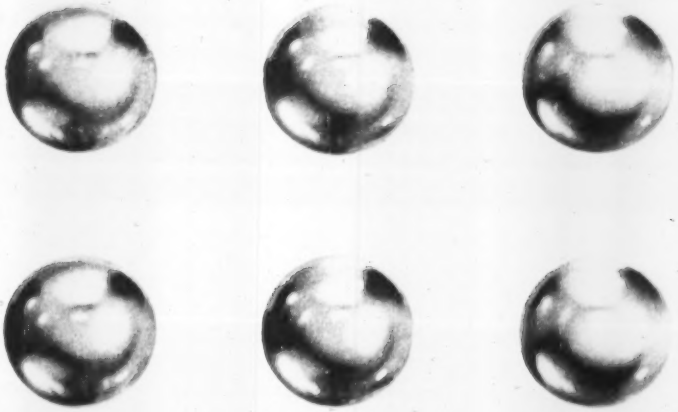
Toward More Diemakers

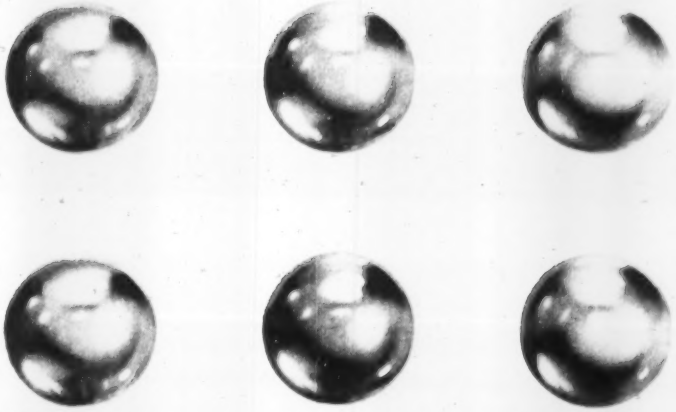
In your Feb. 22 issue, the article "Toolmakers Aid Apprentices" (p. 86)

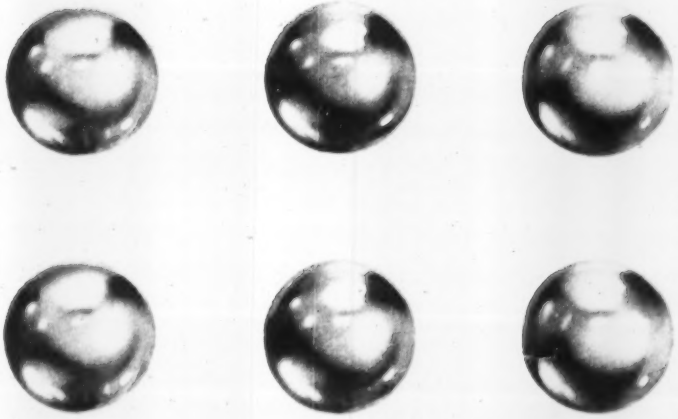
(Please turn to page 12)

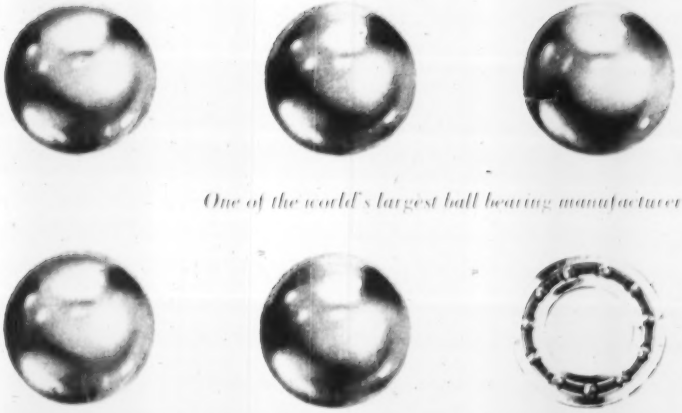


Federalize! *for tomorrow's tools today*









Take a *new look* at Federal!

You'll see how one of the world's largest ball bearing producers keeps ahead in this ever-changing world.

You'll see at Federal automated production that keeps quality at a peak.

You'll see at Federal the newest precision machines—modern machines that make yesterday's wide tolerance bearings as primitive as the equipment they served.

You'll see, too, the latest quality control instruments and inspection methods in use at Federal.

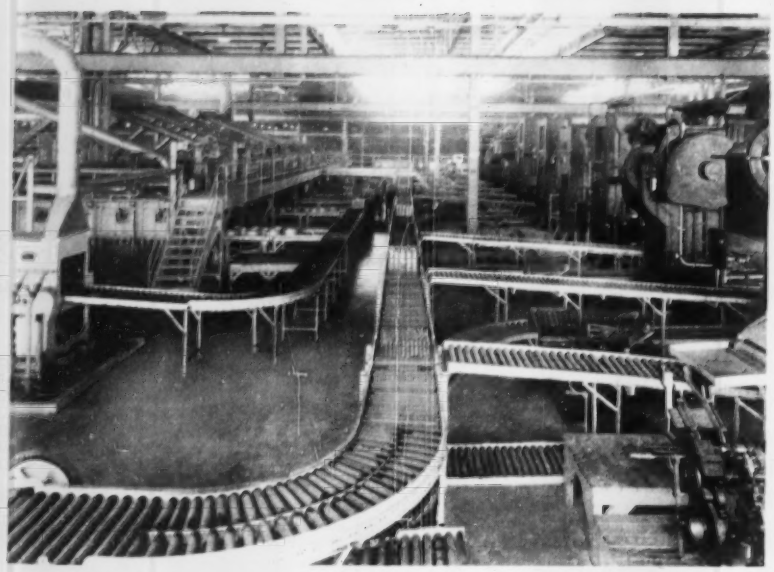
Keep ahead or fall behind is the order of the day. Most alert to that are the purchasing agents and purchasing powers who won't wait till tomorrow for something that can be better today.

These purchasing powers are seeing how yesterday's No. 2 sources of supply have earned the right to become today's No. 1. And they are fast coming to recognize Federal ball bearings as the *modern* leaders in their field.

Federalize—and you've modernized.
Federalize—and you're ahead!

One of the world's largest ball bearing manufacturers THE FEDERAL BEARINGS CO., INC.
POUGHKEEPSIE, N. Y.
Producers of the *Modern* ball bearing

Federal
Ball Bearings

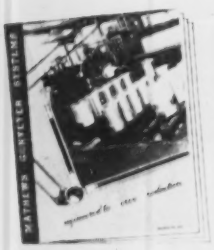


ROLLER CONVEYERS

ONE OF THE MANY TYPES OF HIGH-QUALITY POWER AND GRAVITY CONVEYERS IN THE MATHEWS LINE

● Whatever the package you are handling — whether its weight is measured in pounds or tons — there is a Mathews Roller Conveyer of the right capacity to handle it.

With a range of roller sizes reaching from 1" to 6½" and capacities from 50 pounds to 16,000 pounds, the Mathews Roller Conveyer line is complete. That's why we say, "If it's a roller conveyer job, it's a natural for Mathews engineers."



★

Write for Catalog No. 151 for complete details of roller and wheel conveyers, and for Catalog No. 853 which features numerous installations that might help with your conveying problems. Both are yours for the asking.

MATHEWS CONVEYERS

GENERAL OFFICES . . . . . *Mathews Conveyer Company*
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PACIFIC COAST DIVISION . . *Mathews Conveyer Company, West Coast*
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PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

LETTERS

(Concluded from page 10)

refers to a book, *Fundamentals of Tool and Die Making*, and a film, "Tool and Die Making—Keystone of Mass Production," both sponsored by the National Tool and Die Manufacturers Association. This installation is interested in getting more information on these aids.

R. R. Simpson
Captain, U.S.N.
Commanding Officer
U. S. Naval Ordnance Plant
Pocatello, Idaho

● *Write to George S. Eaton, executive secretary, National Tool and Die Manufacturers Association, Public Square Bldg., Cleveland 13.—ED.*

Pros and Cons of Leasing

Commencing with your Mar. 29 issue and running for three weeks you presented a series of articles on the various pros and cons of renting and leasing industrial equipment. Can we obtain from you either tear sheets or copies of each of the three issues?

John L. Addy Jr.
Addy & Luby Machinery Co.
Detroit

We are wondering because of the current popular discussion of this subject if you may be planning to have reprints available. If so, we should appreciate having three copies of each.

R. W. Miller
secretary and controller
Lodge & Shipley Co.
Cincinnati

When reprints of these articles are available, will you please send us 40 copies of each? I would like to have them to mail with a special bulletin to our branch offices and dealers.

J. M. Dolan
Hydraulic Press Mfg. Co.
Mt. Gilead, O.

Please send tear sheets of all three installments . . .

Noble O. Carpenter
Central National Bank
Cleveland

Please send 100 tear sheets . . .

Fred E. Shand
Machinery & Allied Products Institute
Chicago

● *We are putting all three articles into one reprint and they will be sent as soon as they are ready.—ED.*

Enlisting Industry's Help

Your Windows of Washington (Apr. 5, p. 64) "U. S. Seeks Industry's Know-How To Help Sell America Abroad," was splendid—a fine job of accurate and understanding reporting. I know that it will serve a good purpose in helping us to carry on our program of enlisting private industry's support in developing an effective overseas information effort.

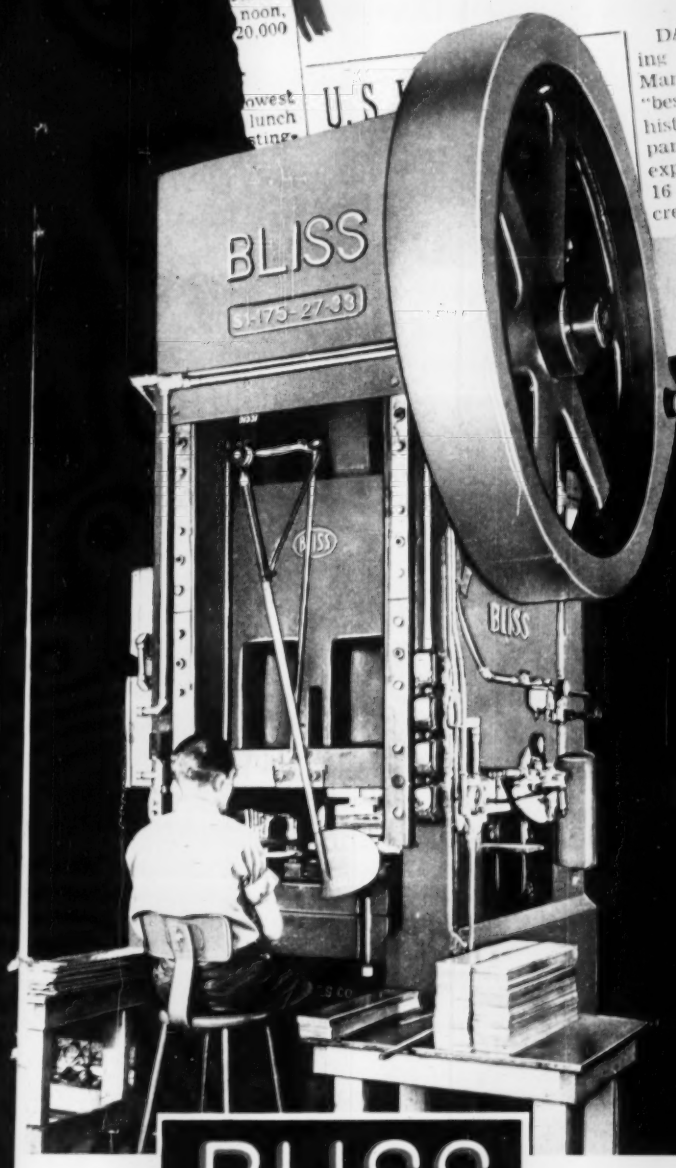
Al Lubin
U. S. Information Agency
Washington

Note:

Angell Completes Major Pressroom Modernization with 16 New Presses... All Bliss-Built!

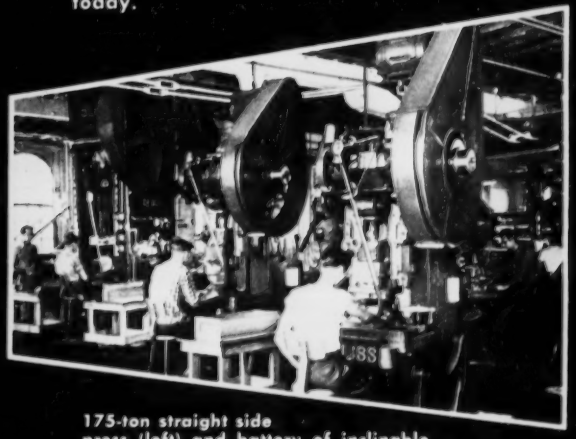
DAYTON, Ohio—New stamping capacity will put Angell Manufacturing Company in the "best competitive position in its history", R. H. Walker, company president, said today. He explained that the addition of 16 new Bliss presses has increased the company's capacity by 50%. Angell manufactures embossed, etched and lithographed nameplates, dials and escutcheons.

Angell decided to place all their press business with Bliss after years of experience with several makes of stamping presses. According to Mr. Walker, the Bliss presses were selected for their dependable operation, ease of set-up and maintenance, and reliable clutch performance.



THERE MUST BE A REASON why Bliss presses are the unanimous choice of so many large contract shops. Dependable equipment? That's for sure: industry *knows* when it buys Bliss it buys designs that have stood the test of years.

To learn how Bliss presses can fit into your modernization plans, call for a Bliss engineer today.



175-ton straight side press (left) and battery of inclinable presses (above) are typical of new Bliss equipment used in the manufacture of nameplates, escutcheons and television panels.

BLISS SINCE 1857

on your press is more than a name... it's a *guarantee*

E. W. BLISS COMPANY, Canton, Ohio

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd., Derby • E. W. Bliss Company (Paris) France

U. S. Plants in Canton, Salem and Toledo, Ohio; Hastings, Michigan; and San Jose, Calif. *Branch Offices* in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. *West Coast Representatives:* Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Company, Seattle. *Other representatives throughout the world.*

THEY LOOK ALIKE

Cast rail and fabricated base assembly

One-piece Gray Iron rail

...but compare production costs!

GRAY IRON CHARACTERISTICS INCLUDE:

Castability
Strength
Rigidity
Low Notch Sensitivity
Wear Resistance
Heat Resistance
Corrosion Resistance
Durability
Vibration Absorption
Machinability

One-piece Gray Iron casting cuts machining and assembly steps

Still another manufacturer has found that one-piece Gray Iron castings lower production costs and improve product performance.

Shown above are two types of main rails along which an oxyacetylene shape cutting machine travels. One is a two-piece assembly . . . the other is all Gray Iron.

By redesigning as a one-piece Gray Iron casting, this manufacturer eliminated two machining operations and one assembly operation formerly required to make the fabricated rail. Because of the inherent dimensional stability and rigidity of Gray Iron, cutting accuracy of the machine is held to .015" over the 12' of travel.

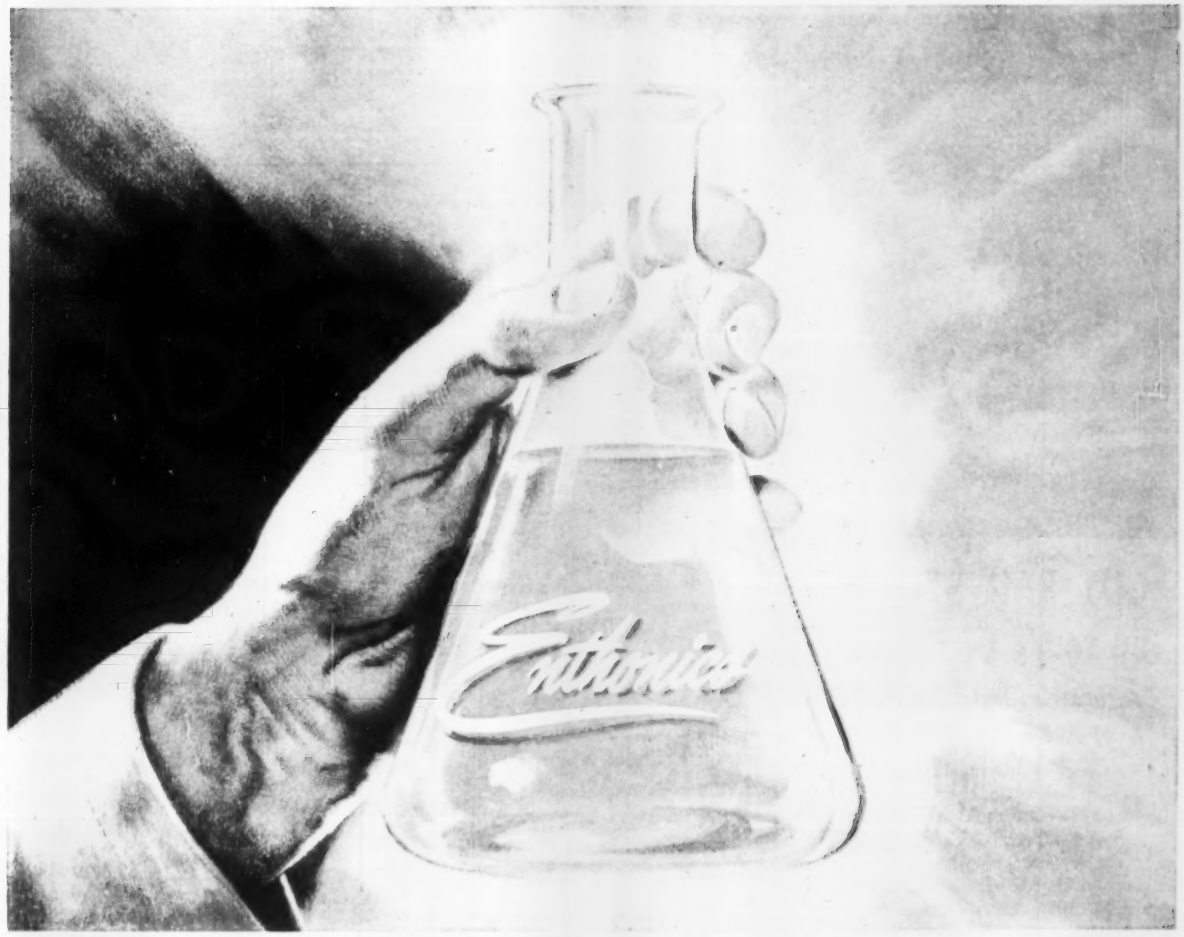
Have you taken a good look at the cost-saving and improved performance possibilities of redesigning your fabricated parts for Gray Iron casting? Why not let us help you—write for technical information on the many advantages of the Gray Iron casting process.

MAKE IT *BETTER* WITH GRAY IRON

75% of all cast metal products are Gray Iron

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO



The Scientific Solution of Metal Finishing Problems

"Enthonics" designates the scientific, analytical approach to the problems of the metal finishing industry as the basis for the technical service provided by Enthone, Inc.

Enthonics has as its objectives the solution of difficult metal finishing problems and the creation of finishes that provide new beauty, utility and durability for every type of metal and metal product. Dedicated to this program and method, Enthone, Inc. maintains a large staff of top-flight chemical engineers and metallurgists who devote their extensive technical training and knowledge to continuous and intensive research in the laboratory and in the field. The results of this research include more than 60 basic processes and chemicals that have made possible finer finishes at lower cost.

Widely recognized throughout industry as a pioneer and leader, and backed by the experience gained in over 20 years of outstanding achievement, Enthone has the ability to provide manufacturers with a complete engineering and advisory service. Basic or specially formulated chemicals or processes are expertly application-engineered to meet practically every type of individual finishing problem.

An outstanding example of "Applied Enthonics" was the creation of the "Alumon" process during the war years. Developed for the aircraft industry, this process is a method of electroplating aluminum to provide corrosion resistance and secure other properties such as reflectivity, heat resistance and solderability. The "Alumon" process is now used by hundreds of manufacturers to plate aluminum products with nickel, chromium, gold and many other methods. Future ads will feature other outstanding examples of "Applied Enthonics."

For complete information about Enthone products and processes, send for the Enthone *Product Index*; it's yours for the asking.

ENTHONE

METAL FINISHING PROCESSES

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ELECTROPLATING CHEMICALS

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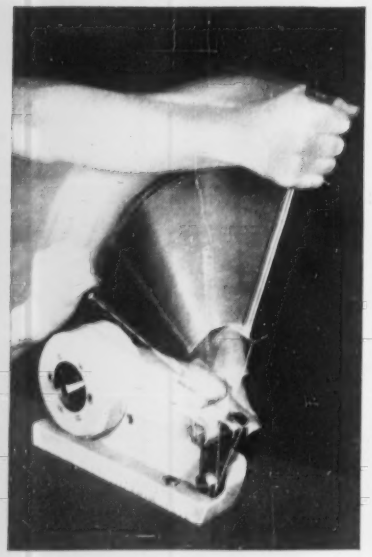

CUT BAR STOCK up to 5/8" Diameter

Accurately, Instantly with a DI-ACRO* ROD PARTER

The shearing-breaking action of a Di-Acro Rod Parter allows most bar stock to be cut without burr and distortion. After parting, the bar is easily inserted into a hole its same diameter and the end can be threaded or riveted without further processing.

Holes in cutting heads accommodate eleven different round stock sizes. Also special heads for cutting square, and other shaped bars.

BOTH HAND AND POWER MODELS AVAILABLE

Instantaneous cutting action with Di-Acro Power Rod Parter. Rate of production is limited only by speed with which stock can be fed. Motor driven flywheel, other moving parts housed in welded, steel cabinet.

*pronounced Die-ack-ro

Like More Information? . . . Send for 32-Page Catalog

Gives complete details on hand and power operated Di-Acro Rod Parters, Benders, Brakes, Notchers, Punch Presses, Rollers and Shears.

Creators of "DIE LESS DUCTILATING"

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304 Eighth Ave.
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MILL PRODUCTS
The most complete line in Aluminum

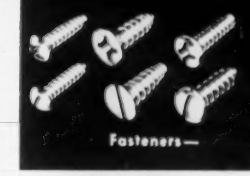
Sheet and Plate—

Wire—

Rolled Shapes—

Tube and Pipe—

Bar Stock—


Fasteners—

Welding and Soldering—

Extruded Shapes—

While you buy screw machine stock by the pound, you machine it by the foot. Because a pound of aluminum gives you three times more feet of stock than a pound of brass, you get more material for your money.

You can get high production rates, too. Surface speeds are frequently higher than those used for most other metals; 1000 feet per minute is common and the figure runs even higher with carbide tools.

Although aluminum needs no special finishing for good appearance, it takes any finish. You can polish, buff, brush or burnish it. You can use anodic treatments for extra corrosion resistance and for a wide range of colors. Or you can electroplate with other metals to match companion parts.

Alcoa, pioneer in aluminum, has developed four screw machine alloys, each outstanding. Alcoa 11S-T3 is the general-purpose, free-machining alloy. Stronger Alcoa 17S-T4 is best for deep hole drilling. Alcoa 24S-T4, even stronger than 17S-T4, is used for aircraft and other high-strength applications. Alcoa 61S-T6 provides high corrosion resistance and is best for anodic treatments. Your local Alcoa sales office can draw on the world's greatest fund of aluminum knowledge to advise you on alloy selection and production techniques.

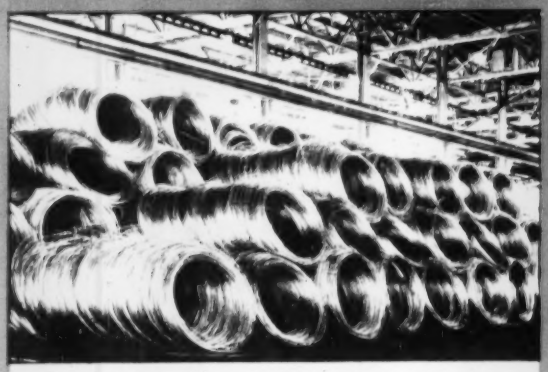
Alcoa
Screw Machine Stock

Combines low cost with ease of machining; takes any finish.

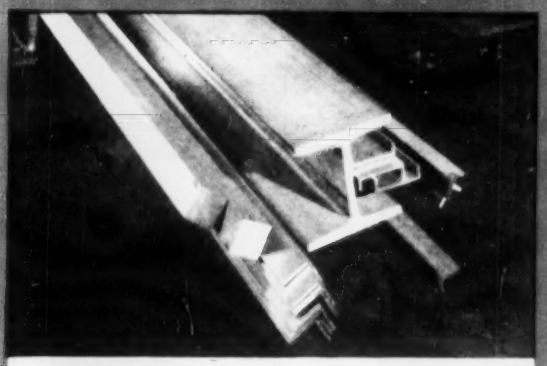
Products of Sixty-Five Years of Pioneering in Aluminum

EXTRUDED SHAPES: For thresholds; window sills; door frames; glass stops; copings; gravel stops; trim; truck bodies. Also angles; channels; tees; zees; etc., for structures.

TUBE AND PIPE: Coiled tube; Alcoa Utilitube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; construction pipe; rigid conduit.

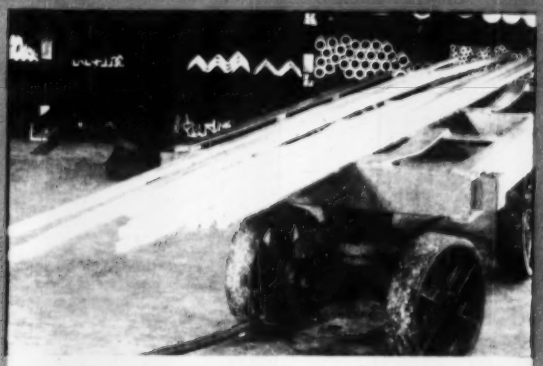


WIRE: Coiled and straight length; flattened wire; rivet wire and rod for die heading operations in manufacture of rivets, nails, bolts and screws.



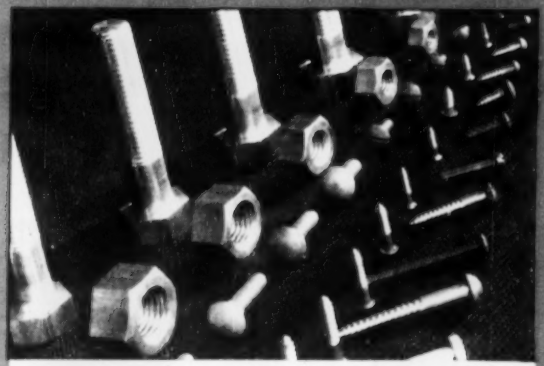
ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; tees; zees. Suited to a variety of structural applications.

SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



BAR STOCK: Square, hexagonal and rectangular in all commercial alloys. Rolled and cold finished to final dimensions for superior tolerance and finish.

SCREW MACHINE STOCK: Available in 11S-T3, the free-machining alloy and 17S-T4, a higher strength alloy plus 24S, 61S and 75S.

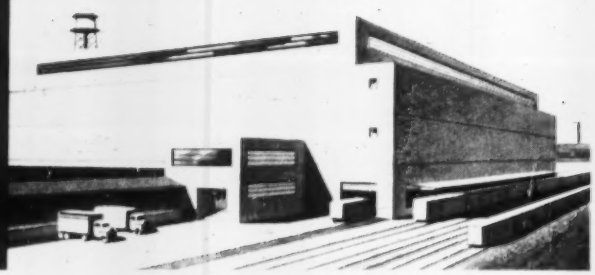


FASTENERS: Machine screws, wood screws; washers; nuts; bolts; rivets. Recommended for fastening aluminum to prevent electrolytic damage.

WELDING AND SOLDERING: Welding and brazing wire; welding and brazing flux; solder flux; solder.

Your Alcoa Distributor has Alcoa Standard Warehouse items in stock

Your Alcoa Distributor is as near as your telephone and his warehouse is stocked with the aluminum products you need for fast, economical production. His facilities include modern equipment for sawing, shearing and slitting stock to your specifications and for making prompt deliveries.



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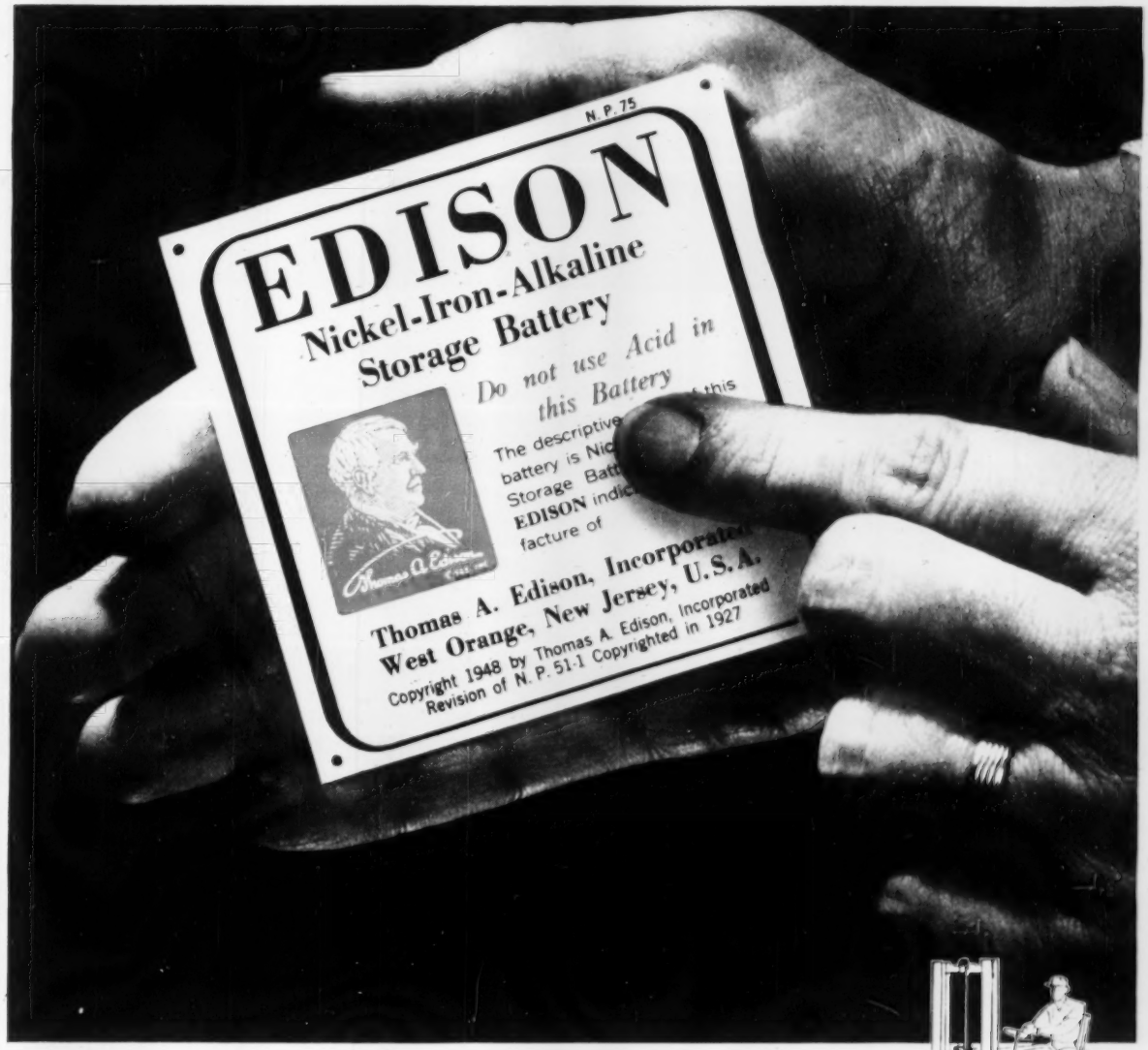
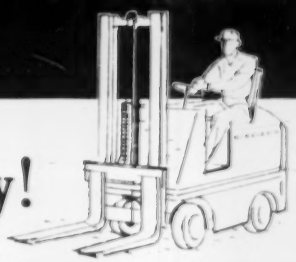
ALCOA ON TV brings the world to your armchair with "SEE IT NOW" featuring Edward R. Murrow, Tuesday evenings on most CBS-TV stations.



The big difference in battery economy!



The battery economy you gain from Edison begins with the design and function of the battery itself. Edison Batteries are of steel cell construction with plates, and containers of steel. They employ an alkaline electrolyte. This electrolyte actually preserves the steel plates within the cell.

What does this mean to you in industrial truck operation? Simply the economy of *more than twice the service life* in battery operation . . . as well as an operating dependability that can't be matched!

Why not profit today from a complete explanation of Edison's many unusual battery features and the basic economies they provide to industrial truck operations? Send for Bulletins 2039 and 3808. To request a visit from the Edison field engineer in your area, simply write Edison Storage Battery Division, Thomas A. Edison, Incorporated, West Orange, New Jersey.

Most dependable power... lowest over-all cost you get both with an EDISON

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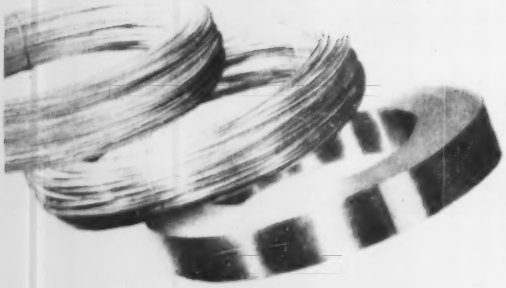
Nickel · Iron · Alkaline

STORAGE BATTERIES

EDISON ALSO MAKES THE FAMOUS "V-P." VOICEWRITER AND TPS TELEVOICE SYSTEM



Follow Through IS IMPORTANT

From the time master craftsmen make the basic raw material in our own Steel Mill until Washburn Wire and Strip is ready for shipment to our customers, specifications for uniformity in all respects are rigidly followed . . . at various stages a percentage of each operation is examined microscopically.

It's this STRICT FOLLOW THROUGH that produces WASHBURN Steel . . . Top Quality Steel that gives your products the advantage of today's advancing standards. If Strip, rectangular, round and flat rods, tempered and untempered flat and round high carbon wires fit into your picture, write for information on any application you have in mind.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS STRIP RECTANGULAR, ROUND, FLAT RODS TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

shearing 30 sizes in 6 gauges accurately... on CINCINNATI SHEARS

Photo courtesy of St. Charles Manufacturing Co.

Shearing 400 items of kitchen and hospital equipment from 10 to 24 gauge sheets, on two nine-hour shifts six days a week, 4 Cincinnati Shears equipped with the Cincinnati Magnetic Sheet Support are highly productive machines in the St. Charles Manufacturing Company shops.

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Write for Shear catalog S-6.

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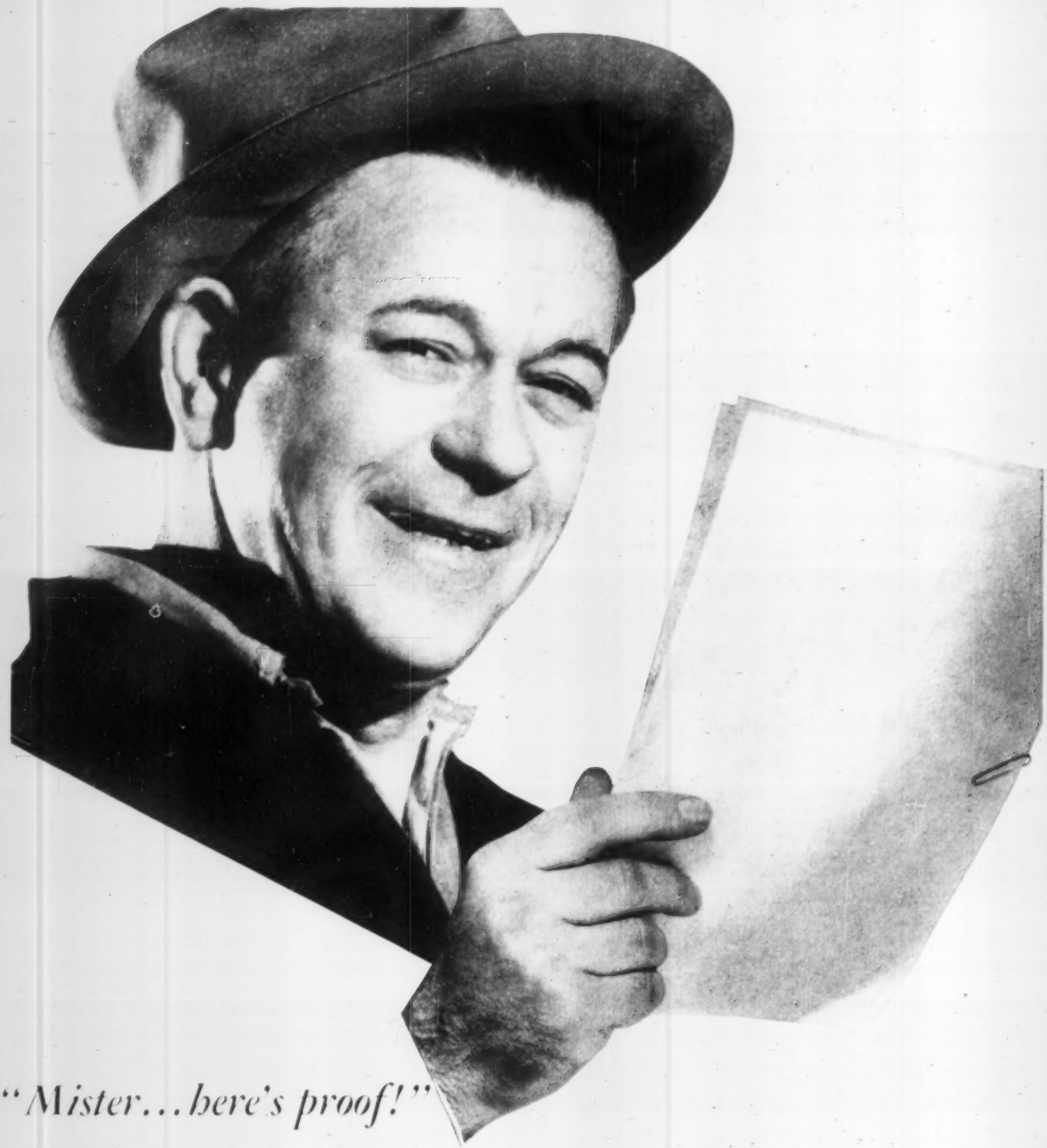

"Mister... here's proof!"

Figures don't lie! Cost reports prove the efficiency and economy of any product. That's why you'll see METAL BLAST abrasives being used in so many foundries. Cost reports show that both ANNEALSHOT (chilled) and SUPER-ANNEALSHOT (malleableized) do an outstanding job of cleaning castings . . . *and* hold cleaning costs to a minimum.

METAL BLAST abrasives are made of highest quality materials—formed and heat treated in the most modern equipment—come to you at prices equal to or lower than any other abrasives in the market. If it's proof of their efficiency and economy you want—order a trial supply and find out for yourself. **METAL BLAST, Inc.,** 872 East 67th St., Cleveland 3, Ohio.

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METAL BLAST ANNEALSHOT
chilled shot and grit
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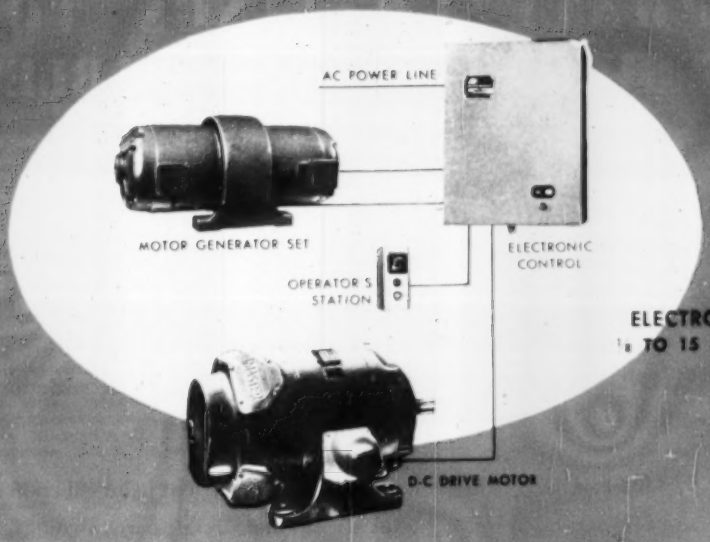
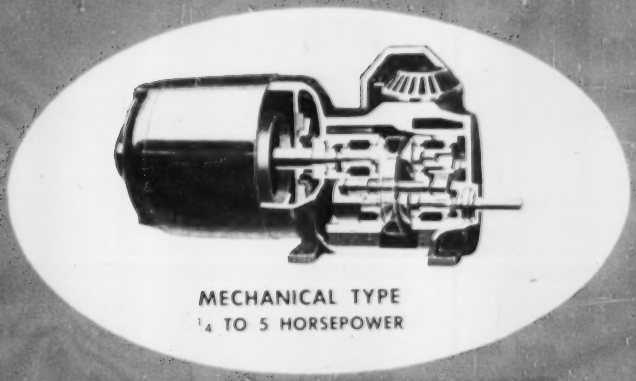
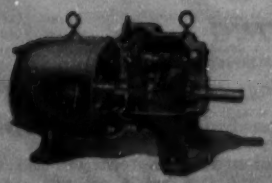
malleable shot and grit



ELECTRONIC TYPE
1/8 TO 15 HORSEPOWER



MECHANICAL TYPE
1/4 TO 5 HORSEPOWER



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WHICH SPEEDRANGER IS BEST FOR YOU

Need variable speed . . . come to MASTER, the only manufacturers of variable speed drives who can offer you a choice between the advantages of MECHANICAL variable speed and ELECTRONIC variable speed operation. And since both the mechanical and the electronic drives are available with any of MASTER'S five types of gear units, you can secure speed variation in either high speed or low speed ranges. Always check with MASTER for impartial help in selecting the drive that is right for you. **THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO**

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ACP metal protective chemicals include: protective coating chemicals for steel, zinc and aluminum; metal cleaners and rust removers; final rinse controls; pickling acid inhibitors; copper coating chemicals; soldering fluxes; alkali cleaners and addition agents; copper stripping and brightening solutions.

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"GRANODINE"® zinc phosphate coatings improve paint adhesion on automobiles, refrigerators, projectiles, rockets, and many other steel and iron fabricated units or components.

"LITHOFORM"® zinc phosphate coatings, make paint stick to galvanized iron and other zinc and cadmium surfaces.

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"PERMADINE"® zinc phosphate coatings provide rust and corrosion proofing for nuts, bolts, screws, hardware, tools, guns, cartridge clips, and many other industrial and ordnance items.

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CALENDAR
OF MEETINGS

April 26-28, American Management Association: Manufacturing conference. Hotel Statler Cleveland. Association address: 330 W. 42nd St., New York 36. Vice president secretary: James O. Rice.

April 26-28, Metal Powder Association: Annual open meeting and exhibit. Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 26-28, Chamber of Commerce of the United States: Annual meeting. Constitution Hall, Washington. Chamber address: 1615 H St., Washington 6. Executive vice president: Arch N. Booth.

April 26-30, American Society of Tool Engineers: Convention and industrial exposition. Convention Center, Philadelphia. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: H. E. Conrad.

April 26-30, Industrial Health Conference: Hotel Sherman, Chicago. Information: Publicity Committee, 1954 Industrial Health Conference, 205 N. La Salle St., Chicago 1, Ill.

April 29-30, Radio-Electronics-Television Manufacturers Association: Joint conference (U.S.-Canadian board meetings). General Brock hotel, Niagara Falls, Canada. Association address: 777 14th St., NW, Washington 5. Secretary: James D. Secrest.

May 2-4, National Tool & Die Manufacturers Association: Board of trustees and committee meeting. Hotel Statler, Washington. Association address: 907 Public Square Bldg., Cleveland 13. Executive secretary: George S. Eaton.

May 2-7, Scientific Apparatus Makers Association: Annual meeting. Broadmoor hotel, Colorado Springs, Colo. Association address: 20 N. Wacker Dr., Chicago. Executive vice president: Kenneth Andersen.

May 3, Wire Reinforcement Institute, Inc.: Annual spring meeting. Boca Raton hotel and club, Boca Raton, Fla. Institute address: National Press Bldg., Washington 4. Managing director: Frank B. Brown.

May 3-4, American Management Association: Special conference on capital equipment replacement. Hotel Commodore, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

May 3-5, American Mining Congress: Coal convention. Hotel Netherland Plaza, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

May 3-5, Association of Iron & Steel Engineers: Spring meeting. Bellevue-Stratford hotel, Philadelphia. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. J. Ess.

May 3-6, Air Pollution Control Association: Annual meeting. Patten hotel, Chattanooga, Tenn. Association address: 1400 Fifth Ave., Pittsburgh 31. Executive secretary: Harry C. Bauman.

May 3-8, Concrete Reinforcing Steel Institute: Annual meeting. Boca Raton hotel and club, Boca Raton, Fla. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

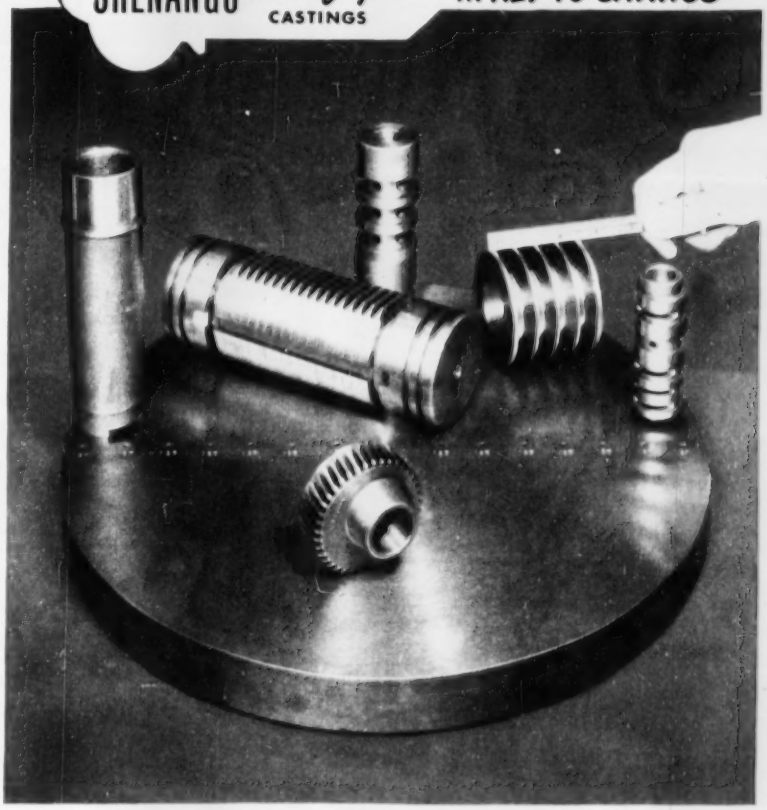
May 4, Steel Joist Institute: Annual meeting for members. Boca Raton hotel and club, Boca Raton, Fla. Institute address: Dupont Circle Bldg., Washington 6. Managing director: C. H. Luedeman.

May 4-6, Electronic Components Symposium: Auditorium, U. S. Department of Interior, Washington. Information: Radio-Electronics-Television Manufacturers Association, 777 14th St., NW, Washington 5.

May 4-7, American Welding Society: National spring technical meeting and exposition. Hotel Statler and Memorial Auditorium, Buffalo. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

May 8-11, American Foundrymen's Society: Annual convention and technical exposition. Public Auditorium, Cleveland. Society address: 616 S. Michigan Ave., Chicago 5. Secretary-treasurer: W. W. Maloney.

SHENANGO *Centrifugal* CASTINGS ... KEY TO SAVINGS



Examples of finished tool parts machined from Shenango Meehanite Metal bar stock.

For superior quality parts specify

SHENANGO BAR STOCK!

THESE complex and varied machine tool parts were made from Shenango Meehanite Metal bar stock, recognized for close grain, pressure tightness, uniform hardness and exceptional wear resistance.

In addition, the uniformity of Meehanite Metal permits machining at increased speeds. It takes a fine, smooth finish in any cutting, honing, or grinding operation. Can be heat-treated too. When you specify Meehanite Metal bar stock you receive longer wear, minimum machining loss and freedom from defects.

These and other outstanding Shenango features add up to maximum versatility, minimum rejection, and the cost-cutting solution to many design and maintenance problems.

Write today for Bulletin 152. Address . . .

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
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Executive Offices: Pittsburgh, Pa.

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WW

A new metallurgical facility TO SERVE INDUSTRY

WW ALLOYS, INC.,* Division of Fansteel Metallurgical Corporation, proudly announces a substantial new expansion. A complete modern alloy foundry and forge shop is now in operation at Livonia (suburb of Detroit), Michigan.

These new facilities bring forth new products for new fields, including high quality aluminum bronze and copper castings for the machine tool, steel, aircraft and electrical industries. WW Alloys will of course continue to supply high conductivity copper base alloys for resistance welding, as it has for many years.

Please consider this new facility as a dependable source for your special non-ferrous alloy needs, in the form of castings (sand, permanent mold or centrifugal), forgings, finished or semi-finished parts.

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WW ALLOYS, INC.

Division of Fansteel Metallurgical Corporation

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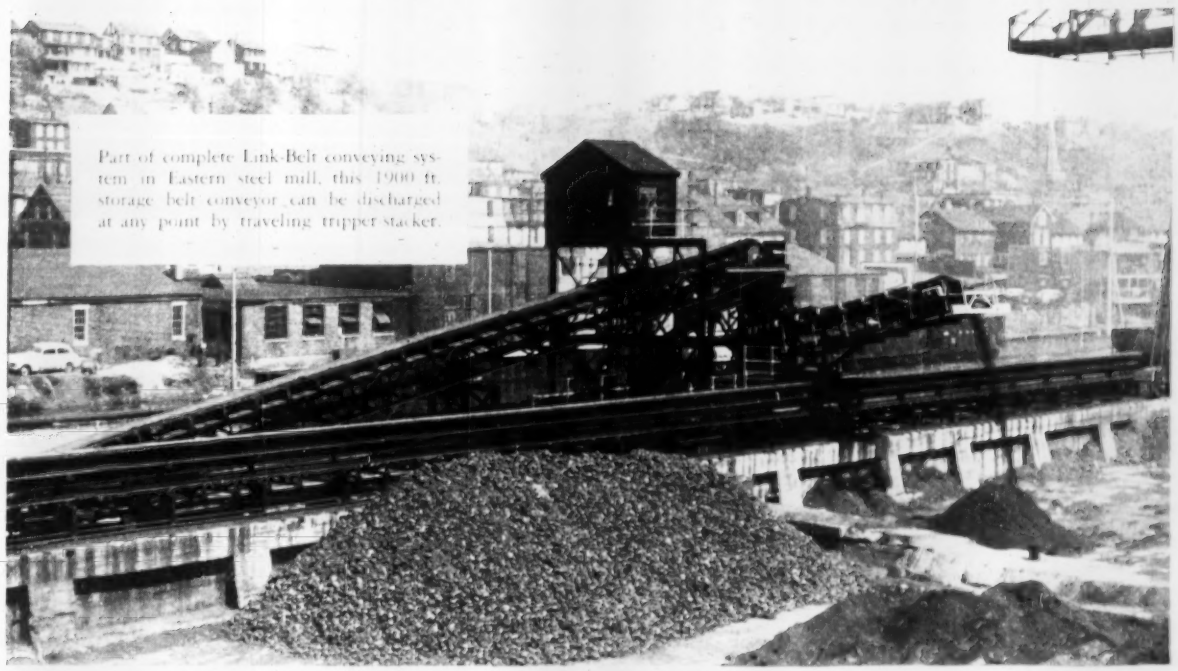


Part of complete Link-Belt conveying system in Eastern steel mill, this 1900 ft. storage belt conveyor can be discharged at any point by traveling tripper-stacker.

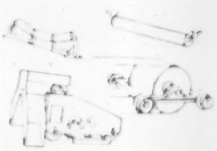
SURE ROAD TO LOWER HANDLING COSTS

. . . carry the load via Link-Belt belt conveyors

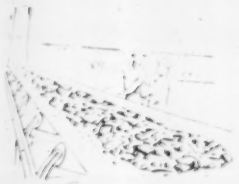
LINK-BELT offers you the "total engineering" so necessary for top efficiency

DESIGNED FOR OVERALL EFFICIENCY—Because of its unrivaled experience, Link-Belt can do a better job of gathering and analyzing all data. Proposals reflect this understanding of the most practical way to fit individual conveyors into your overall system requirements for best results.

BUILT FOR LONG-LIFE PERFORMANCE—Link-Belt manufactures all components and related feeders and conveyors. You are assured of the right equipment because of this breadth of line. And Link-Belt will supply the highest grade belts engineered to the specific job.



DELIVERS FULL RATED CAPACITY—Link-Belt follows through on every detail of the job,—including electrical controls and even wiring and foundations. What's more, Link-Belt will furnish experienced erection superintendents, staffs and skilled crews at the customer's request.



ASSURES SATISFACTORY PERFORMANCE—When you rely on Link-Belt as a single source for your complete system, we accept responsibility for placing it in full operating readiness. We will also supervise modernization of existing systems. For all the facts call your nearby Link-Belt sales representative.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7. Canada, Scarboro (Toronto 14); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World

Do you have a product that's ready for a push?

Imagine the impact your product story gets when its carried simultaneously to all your best customers and prospects!

If you're dusting off a product on which restrictions have been lifted . . launching a brand new product . . . or preparing an old product for new applications . . . aggressive sales efforts can pay off handsomely in an expanding market.

That's metalworking—your biggest industrial market—*twice* as big as it was ten years ago!

But keep in mind, metalworking is people . . . people with the need, the buying influence and the purchasing power to buy your product. STEEL directs your product story to *more of this essential buying group* than any other metalworking magazine!

With the help of its Continuing Census of the industry, STEEL reaches over 133,000 of these men who manage, operate and buy for metalworking. They include your *best* customers and prospects!

Ask the man from STEEL to show you how STEEL Magazine helps you size up your metalworking sales opportunities, helps make your sales and advertising program more effective, and helps give your product-story *added strength where it does the most good!* STEEL, Penton Building, Cleveland 13, Ohio.

PUT THE STRENGTH OF STEEL INTO YOUR ADVERTISING PROGRAM

clean strong accurate...

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From head to thread Republic Hex Head Cap Screws are made right.

Heads are square-faced to take wrench snugly...strong to avoid slippage on tough pull-ups.

Shanks are tough and sturdy to withstand shock and vibration.

Threads are clean, sharp and accurate with full engaged-thread area.

More than 20,000 regular types and sizes of headed and threaded items make Republic Steel a good source for all your fastener needs.

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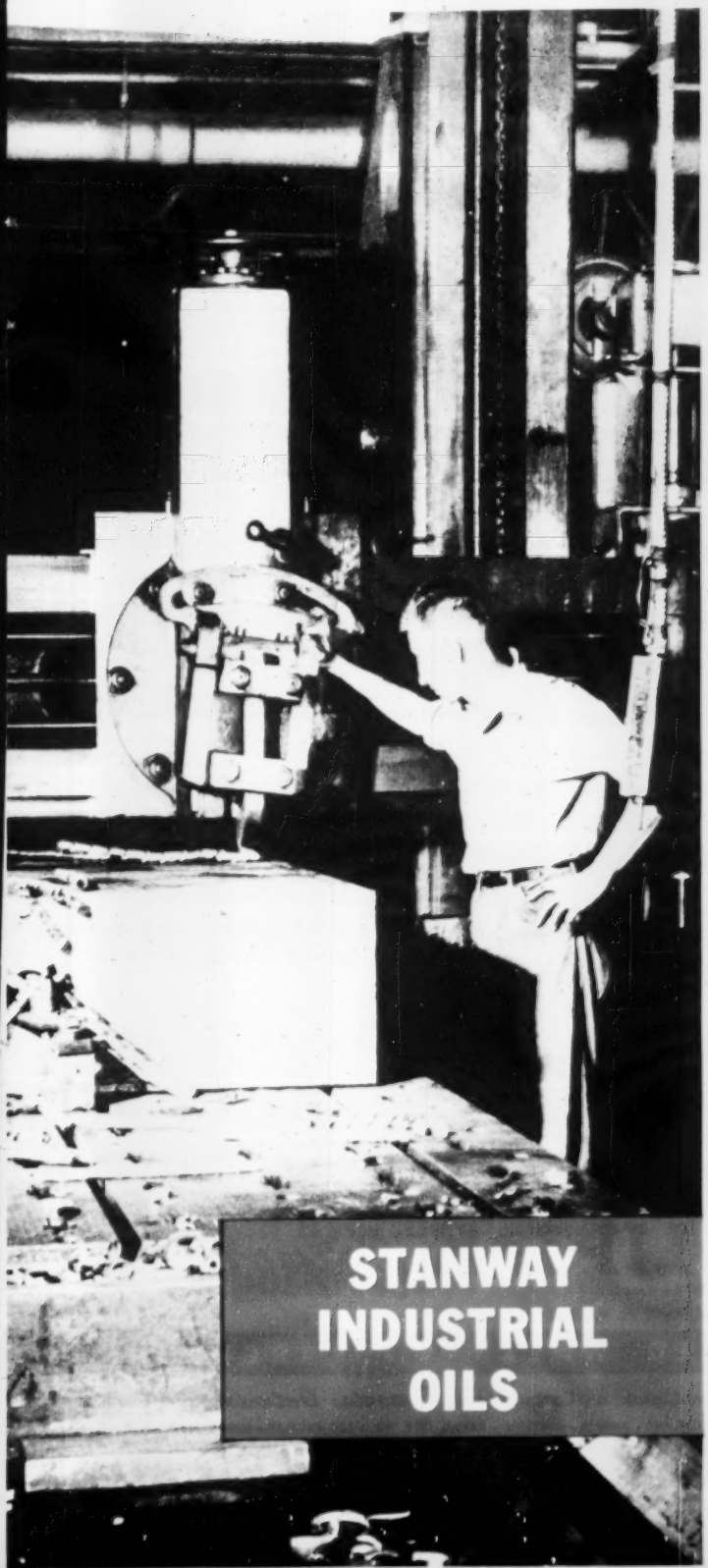
Other Republic Products include Pipe, Sheets, Tubing, Hot Rolled and Cold Drawn Bars—Carbon, Alloy and Enduro Stainless Steels

How a little talk
(with the right person)

The "right person" was E. F. Aschemeyer, at left, Standard Oil lubrication specialist. His practical experience and training helped Elkin solve their problem.



stopped a lot of chattering

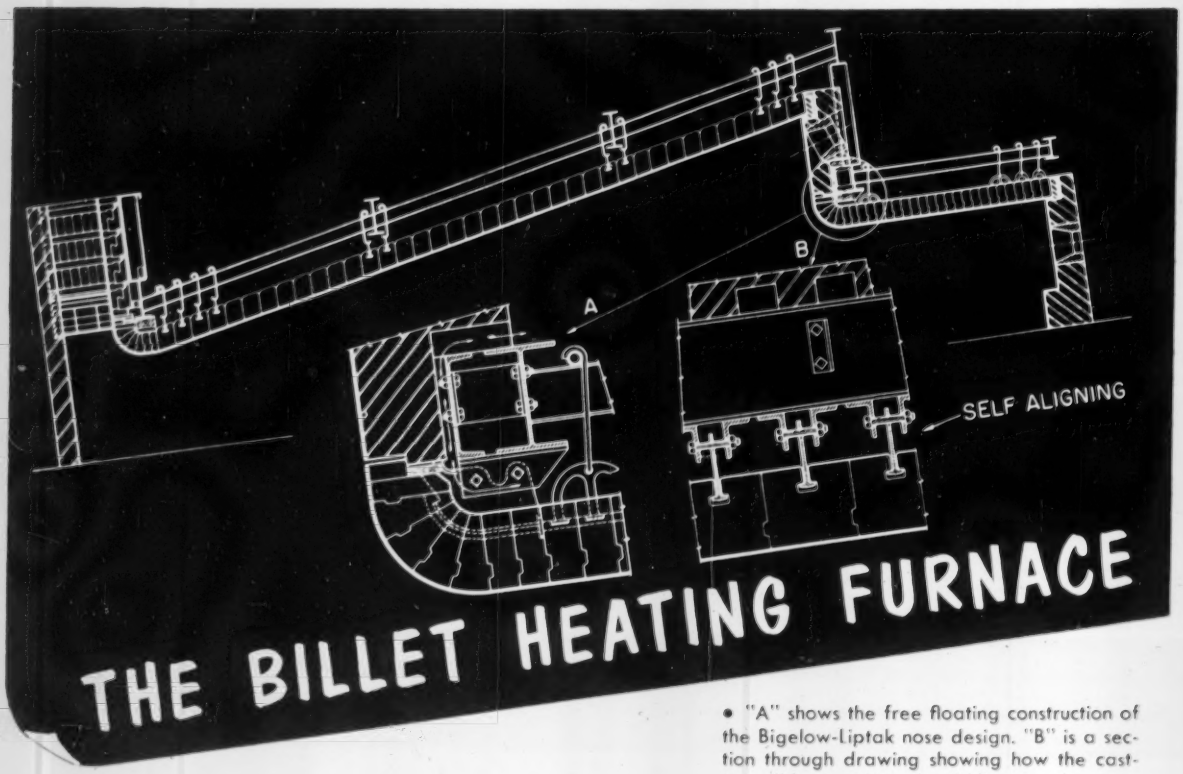
Chattering and scoring of ways was causing trouble for the Elkin Tool and Manufacturing Company of Detroit. The trouble was noted on a big planer operating under extremely heavy loads. A Standard Oil lubrication specialist recommended the use of STANWAY #95, a very stable oil having extreme oiliness and containing a tackiness agent. Result: smooth operation, complete elimination of chattering and scoring.

STANWAY Industrial Oils were developed to meet the extreme oiliness requirements of certain machine tools which customarily operate under very heavy loads. STANWAY Oils are part of a complete line of industrial oils, cutting oils and coolants that serve all industry.

No matter how "special" your problem may be, there's a Standard Oil product to solve it. There's also a near-at-hand Standard Oil lubrication specialist to help you select and apply the right one. To obtain his services call the Standard Oil office nearest you, or write Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD

STANDARD OIL COMPANY
(Indiana)



THE BILLET HEATING FURNACE

• "A" shows the free floating construction of the Bigelow-Liptak nose design. "B" is a section through drawing showing how the castings slide on supporting bolts.

THAT LEADS WITH ITS NOSE...

THE PROBLEM . . .

A new radial nose tile for billet heating furnaces. Previously, cumulative expansions of rigidly hung nose tile in wide metallurgical furnaces had caused mechanical failures of tile and castings . . . plus "shut down" losses of production time.

THE ANSWER . . .

A *free floating* nose designed by Bigelow-Liptak engineers to control expansion movements at this highly vulnerable point. The free floating feature is only possible with unit-suspension construction . . . another Bigelow-Liptak development.

THE RESULT . . .

Steady, everyday, on-the-line effectiveness.

Write today for more information on industrial furnace enclosures.

BIGELOW-LIPTAK *Corporation*

and Bigelow-Liptak Export Corporation
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UNIT-SUSPENDED WALLS AND ARCHES

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Here's how you save

WITH THE

DU PONT SODIUM HYDRIDE DESCALING PROCESS

1. SHORT TIME CYCLE

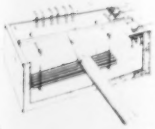
Only 15 seconds are required to get cold reduced-annealed strip clean and bright—10 to 20 minutes for fabricated articles, sheets, wire, rods, bars and forgings. Even heavily scaled forgings (1/2" scale thickness) take less than an hour!

2. NO LOSS OF BASE METAL

There's no danger of costly rejects due to pitting, etching, or loss of gauge with the Du Pont process—no matter how long work is left in the bath. This permits working to closer tolerances and assures high dimensional accuracy.

3. RETREATMENTS RARELY NEEDED

One pass through the sodium hydride bath will do the job completely. You can maintain uniform speed in production-line descaling. Quick completion of orders means you can substantially cut down on inventory in process.



4. SIMPLIFIED PROCESS

No scale-breaking or special racking procedures are required. Finished stock of any size or shape can be completely descaled with the versatile Du Pont process. Even dissimilar metals can be treated in the same bath—at the same time!

5. EASY TO OPERATE

Any pickler can be trained in a few hours to run the Du Pont Sodium Hydride Descaling Process effectively. You can do more work with fewer men and less equipment. And you save on time, space and labor costs.

6. DU PONT TECHNICAL SERVICE

If you are descaling metals which are unaffected by fused caustic at 700°F., it will be to your advantage to talk with us about the Du Pont Sodium Hydride Process. Du Pont pioneered this modern descaling method and can bring a depth of technical experience to bear on your descaling problems. There's no cost for this service which includes laboratory investigation of problems plus expert aid in the construction, installation and operation of the process. Just call our nearest district office or send in the coupon below.

SEND FOR FREE BOOKLET describing the Du Pont Sodium Hydride Descaling Process—how it works—what it can do for you. This illustrated booklet lists the metals that can be descaled with this remarkably efficient process . . . gives brief descriptions of necessary equipment and operating precautions. Just fill out and mail the coupon below for your copy. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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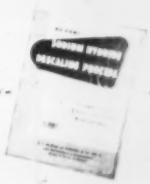

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Electrochemicals Department S-426
Wilmington 98, Delaware

Please send me your free booklet on Sodium Hydride Descaling.

Please have one of your technical men call. I am interested in descaling _____

Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____

DU PONT
Sodium hydride process for positive descaling

DU PONT

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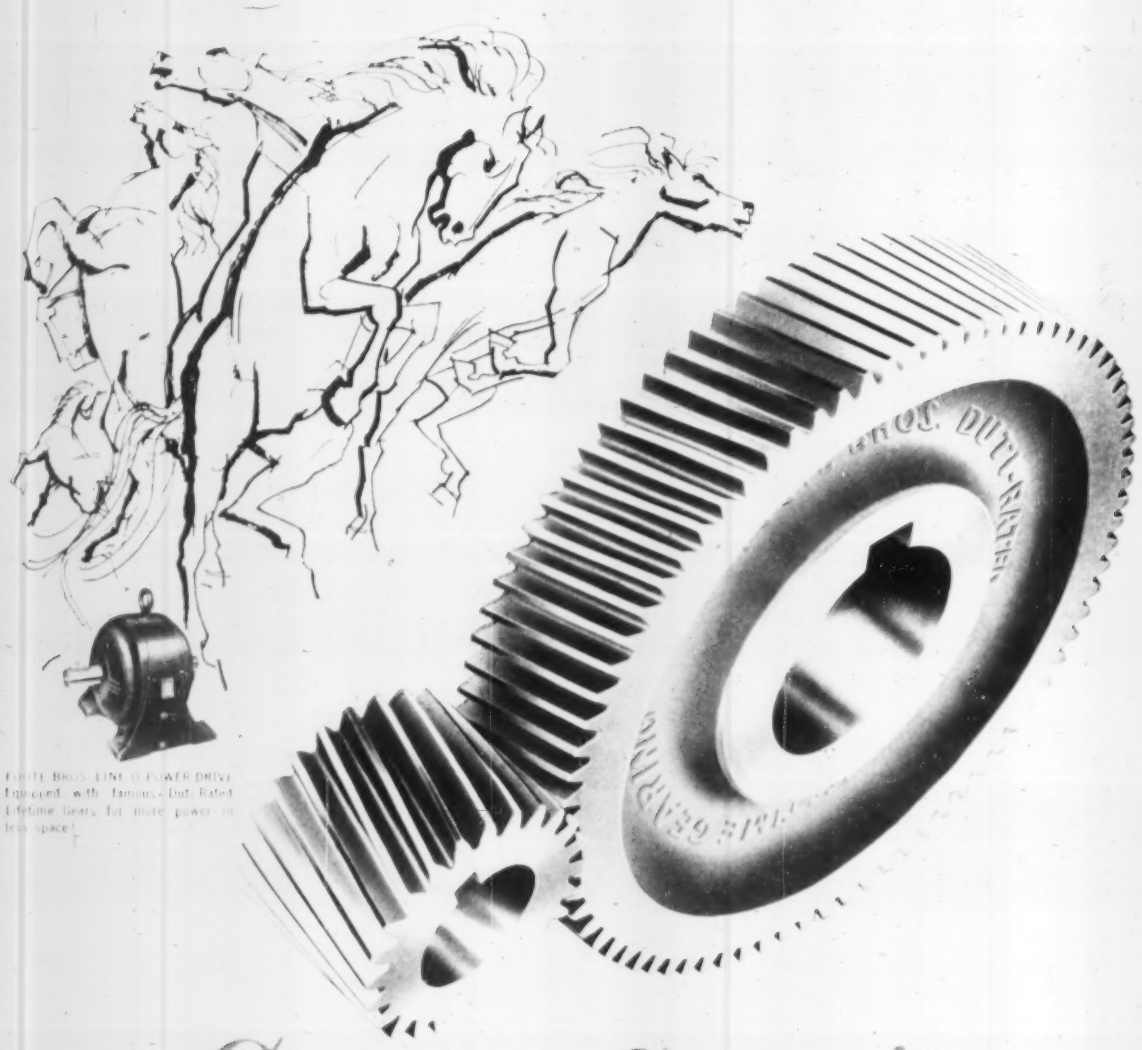

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Greater Capacity

COMES IN A SMALLER PACKAGE

FOOTE BROS.
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LIFETIME GEARING

FOOTE BROS.

Manufacturers of industrial gears and enclosed gear drives of all kinds, gear motors, aircraft quality gears and actuators and special machinery

WITH FOOTE BROS.

Duti-Rated LIFETIME GEARING

A unique development in industrial gear production . . . new, *Duti-Rated Lifetime Gears* . . . a Foote Bros. exclusive! From its vast experience as a leader in aircraft-quality gear manufacture, Foote Bros. has applied the important characteristics of aircraft gearing to its *industrial* gear production. The results are highest quality gears with greatly reduced mass, longer life and higher capacity than ordinary industrial gears. What's more, Duti-Rated Lifetime Gears can *actually cost less* than other gears of similar capacity! The time to investigate is *now* . . . the gears to specify are *Duti-Rated Lifetime Gears!*

WRITE FOR COMPLETE DETAILS . . . on how Foote Bros. Duti-Rated Gears can fit into your picture. Write *today* . . . for better power transmission tomorrow!

FOOTE BROS. GEAR AND MACHINE CORPORATION • 4545 SOUTH WESTERN BOULEVARD • DEPT. W • CHICAGO 9, ILLINOIS

'54 Forecast: MORE ALUMINUM PRODUCTS THAN EVER BEFORE

Reynolds
ALUMINUM REPORTER

MODERN DESIGN HAS ALUMINUM IN MIND

★ ★ ★ Thirteenth in a Series to Industry on Aluminum Uses and Developments ★ ★ ★

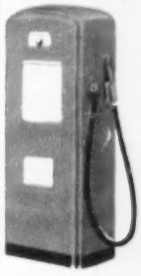
NEW SEAL PROGRAM AVAILABLE TO FABRICATORS

Aluminum Pigments Offer Variety of Finishes . . . Add Beauty and Protection

Polychromatic finishes give designers a new flexibility of design. The sparkling flakes of Reynolds "non-leafing" aluminum pigments added to colored lacquers and enamels give products a lasting beauty, depth and iridescence that enhance their appearance. And it doesn't matter whether the product is made of metal, plywood, plastic, composition, or wood—polychromatic finishes beautify and protect any solid surface.

Wrinkled

Reynolds special patented process eliminates the normal leafing characteristic of aluminum pigments. As a polychromatic finish sets up, the aluminum pigment remains evenly dispersed in the lacquer or enamel to catch light beneath the surface, thus providing depth and sparkling beauty as well as a durable, protective surface. This is true of all three types of polychromatic finishes made with Reynolds "non-leafing" aluminum pigments—Regular, Hammered and Wrinkled.



Regular

These machine finishes are perfect for a wide variety of products. Regular for: cars, trucks, gasoline station pumps, etc. Hammered for: lawnmowers, vacuum cleaners, compressor housings, thermos jugs, etc. Wrinkled for: typewriters, business machines, air conditioners, etc.

Hammered

For names of polychromatic finishes manufacturers and a copy of the free brochure, "Industrial Polychromatic Finishes," contact the Reynolds Office listed under "Aluminum" in your classified telephone directory. Or write the Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

"Designed in Reynolds Aluminum" Seal Offers Fabricators an Opportunity to Put Powerful Reynolds Advertising and Merchandising Support Behind Their Products

As a means of giving their fabricating customers the added benefits of millions of dollars of advertising and merchandising support, Reynolds Metals Company takes pride in announcing a new, "Designed in Reynolds Aluminum" Seal Program for fabricators who use Reynolds Aluminum in their end products.

Because customer acceptance and identity is more vital than ever today in the "battle of the brands" the addition of the Reynolds trademark to the manufacturer's trademark offers a real chance for "Double Identity"—double impact at the consumer level at no additional cost to manufacturers who use Reynolds Aluminum.

This new "Designed in Reynolds Aluminum" Seal will be heavily promoted to millions of consumers through the popular "Mister Peepers" show Sundays on NBC-TV.

National magazine advertising will reach millions more with ads telling customers to look for this new Reynolds Seal on the products they buy. Farm radio shows in 16 selected markets will also promote it. Extensive trade promotions and advertising to business leaders will also be made.

It all adds up to millions of dollars in Reynolds promotion benefiting Seal users.

Reynolds decision to offer this new program to fabricators was made after a survey of the results of the Reynolds Wrap Seal Program launched in 1953 for the benefit of food manufacturers who use Reynolds Aluminum foil in packaging their products. This program has resulted in sales advantages to participating manufacturers and indications are that this new Reynolds Seal Program for fabricators will be even more successful.

Reynolds Industrial Styling and Design Department will assist manufacturers interested in this new program with design and engineering work on their products. For details on how you and your company can qualify to participate in this great new Seal Program, simply write Reynolds Metals Company, 2576 So. Third St., Louisville 1, Kentucky.

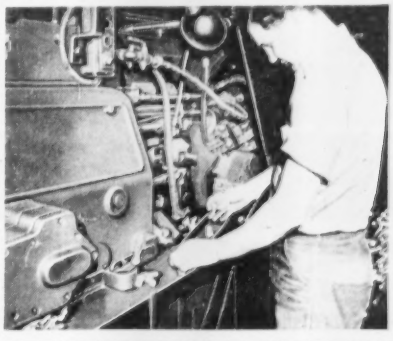
Aluminum Screw Machine Stock Gives Three Times the Number of Pieces Per Pound

Reynolds Aluminum screw machine alloys are recognized throughout industry as having exceptionally good machinability. For this reason more and more manufacturers are relying on Reynolds as their source of supply.

Aluminum screw machine stock has many advantages . . . it gives three times the number of pieces per pound, it is free-machining, has good formability, is strong and corrosion resistant. Reynolds Aluminum machining alloys are available in both bar and rod.

If you have design or production problems take advantage of Reynolds trained technical staff of aluminum specialists. They will help you get set for fast, economical production. With proper techniques and tooling methods, aluminum machining rates are limited only by the top speed of machine tools.

For prompt service, call the Reynolds Office or your nearby Reynolds Distributor, listed under "Aluminum" in your classified directory.



For the complete story on machining with aluminum send for a copy of "Machining Aluminum Alloys." Free when requested on business letterhead. Write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Ky.

MORE INTERESTING NEWS ABOUT ALUMINUM ON NEXT PAGE

(Advertisement)

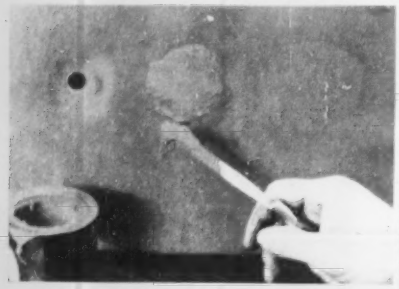
Printed in U.S.A.

(Continued From Preceding Page)

Aluminum Powder Used in "Cold Solder"

A "cold solder" which provides the perfect coating, a hard setting putty and an excellent filling compound—all wrapped into one—for hundreds of industrial, auto body repair and homecraft uses is now being marketed under many trade names.

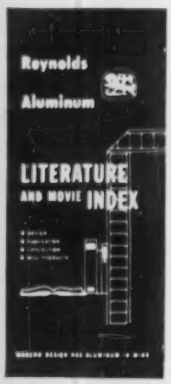
This product is excellent for production, maintenance and repairs requiring a coating or filler with the permanence and hardness of non-corrosive metal. It's easy to use. It may be applied with a putty knife, brushed or sprayed on as the particular item dictates. It sets up rapidly and when dry can be worked like metal—drilled, sanded, buffed, etc.



Of the three holes like that at left originally in this specimen, the center one has just been filled in with "cold solder" while the one at the right previously filled in, has now been sandpapered smooth to complete the repair.

Reynolds Aluminum Powder is an important basic ingredient in many brands of this new "cold solder." For a list of manufacturers write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

Complete Index of All Reynolds Industrial Literature and Films Available



More than seventy-five handbooks, brochures, reprints of publication articles and nine films are listed by title, with description, in Reynolds Literature and Movie Index.

This extensive literature and film listing is conveniently grouped under the headings of Design, Fabrication, Application, Product, General and Movies so that you can quickly locate and select the material of particular interest to you.

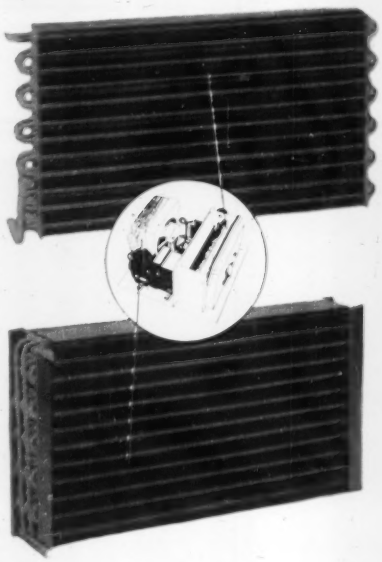
All the helpful Reynolds literature listed in this index is available without charge. Films are also loaned free. To get your copy of Reynolds Literature and Movie Index, simply write today to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Ky.

Printed in U.S.A.

Reynolds Aluminum Fabricating Service Offers Facilities for Producing Room Air Conditioner Evaporators and Condensers

Reynolds wide experience in refrigeration, as one of the nation's leading producers of parts for this industry, has pointed up the advantages of aluminum evaporators and condensers in room air conditioners. This experience—plus Reynolds skill, mass production facilities and quality control from mine to finished product—assures production of all-aluminum evaporators and condensers to quality standards exceeding industry requirements.

All-aluminum evaporators and condensers, produced by Reynolds Aluminum Fabricating Service, assure rapid heat transfer—aluminum fins and tubes facilitate fast, economical cooling and efficient operation. All-aluminum evaporators and condensers can't rust, thus there's no danger of rust from these parts causing unsightly stains below the out-



side of the window. Tubing and fins, both of aluminum, eliminate the possibility of bi-metallic action.

Aluminum's light weight aids in portability and ease of installation. Aluminum is strong—gives years of dependable service. And aluminum is economical. These aluminum advantages add up to serviceability, efficiency and economy unmatched by any other material.

Helpful literature available from Reynolds Aluminum Fabricating Service includes brochures on Appliance Parts, General Facilities and Roll Formed Shapes. For your free copy of any or all of these three brochures, simply write Reynolds Aluminum Fabricating Service, 2065 South Ninth Street, Louisville 1, Kentucky.

Lower Costs Possible for Tools, Dies and Fixtures

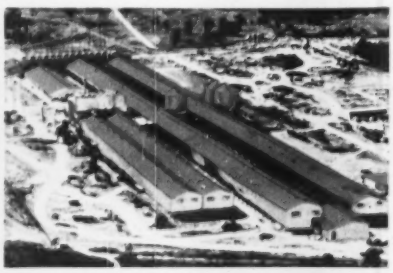
Tools, dies and fixtures made from Reynolds Aluminum Cast Plate and Bar have high dimensional stability and provide better performance and longer production life than other low cost stock.

The outstanding features of this revolutionary material include fine grain structure; precision machined surfaces; light weight; low cost; fast, free machining; good weldability; excellent thermal characteristics. It is available as plate up to 4" x 48" x 144" and as bar up to 8" x 8" x 144".

For free brochure, "Reynolds Aluminum Cast Plate and Bar for Machine Shops, Foundries and Pattern Shops," write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

New Reynolds Plant Lifts Reduction Capacity to 829 Million Pounds

The new Reynolds Metals Company Robert P. Patterson aluminum reduction plant located in Arkadelphia, Arkansas, is now in operation. This plant, shown below, has an annual rated capacity of 110 million pounds of virgin aluminum giving Reynolds an annual production capacity of 829 million pounds.



Opening of the Robert P. Patterson plant marks another important milestone in Reynolds continued expansion in the aluminum industry. Alumina, which is converted into metallic aluminum at the Patterson plant, is supplied by Reynolds alumina plant at Hurricane Creek, Arkansas and La Quinto plant near Corpus Christi, Texas.

Bauxite for the alumina plants is mined near Bauxite, Arkansas, and at Reynolds extensive, new facilities in Jamaica.

(Advertisement)

Handclasp of a friend-in-need

There's confidence in the very "feel" of the world famous C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguishers. The quick-acting "Squeez-Grip" fits your hand naturally like a handclasp . . . hangs right . . . carries right . . . works right. You're in complete command of the situation instantly . . . no fumbling . . . no fatigue.

From the non-conducting, shatterproof discharge horn to the high strength, durably finished cylinder, you get top quality construction that results in a lifetime of satisfactory service. Because of the very few working parts and corrosion resistant materials throughout, the total cost to you over the years is less than other initially lower priced makes . . . fire after fire, recharge after recharge, without trouble.

It's not hard to see, when you fully compare and try, why C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguishers are your best buy for killing flammable liquid and electrical fires, as well as some surface fires involving ordinary combustible materials. Sizes range all the way from $2\frac{1}{2}$ to 100 pounds capacity . . . all fully approved by the Underwriters' Laboratories, Inc., Factory Mutual Laboratories, Armed Forces and Government Bureaus.

With C-O-TWO Squeez Grip Carbon Dioxide Type Fire Extinguishers the penetrating carbon dioxide is a clean, dry, non-damaging, non-conducting, inert gas . . . smothers fire instantly, leaves no after fire mess . . . harmless to equipment, materials and finishes . . . even food is still perfectly edible.

Act now for complete free information on these first rate, sure-acting fire extinguishers. Remember fire doesn't wait . . . get the facts today!

C-O-TWO

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-in High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-in Smoke and Heat Fire Detecting Systems

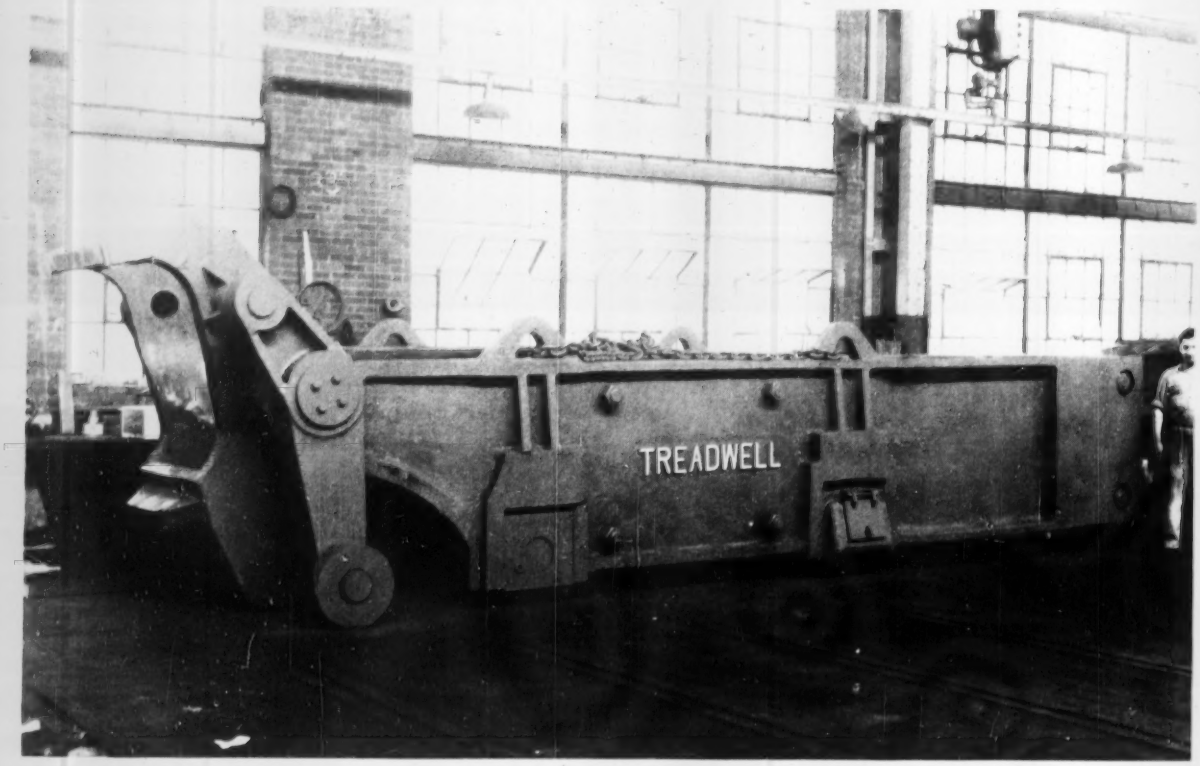
C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

Treadwell



30,000 lb. MOTOR DRIVEN INGOT TRANSFER CAR

These cars are built to handle ingots up to and including 50,000 lbs., and will be built of either cast steel or welded steel construction.

BETTER GRADE MACHINERY

Treadwell Engineering Company

EASTON, PA.

SALES AND ENGINEERING OFFICES:

208 S. LA SALLE STREET
CHICAGO 4, ILL.
CEntral 6-9784

140 CEDAR STREET
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WOrth 4-3344

1015 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
ATlantic 1-2883

extra service is our specialty, too

You get fast, efficient delivery of specialty steels from all of our 26 conveniently located warehouses and sales offices. And the services of Crucible's trained staff of experienced sales engineers and metallurgists is always available to help with your steel problems.

All of our warehouses are well stocked with a full selection of Rex high speed, tool, Rezistal stainless, alloy, Max-el and other types of special purpose steels.

Call us and see for yourself that Crucible's extra service is no idle claim.

Stocks maintained of:

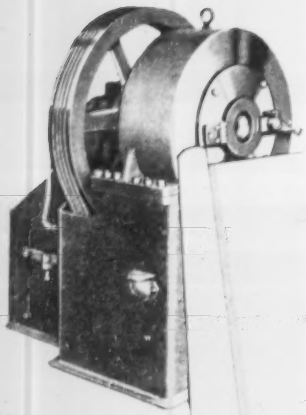
Rex High Speed Steel ... ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) ... Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) ... AISI Alloy, Max-el Machinery, Onyx Spring and Special Purpose Steels

CRUCIBLE first name in special purpose steels

54 years of *Fine* steelmaking **WAREHOUSE SERVICE**

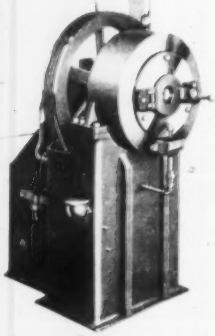
CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DAYTON DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

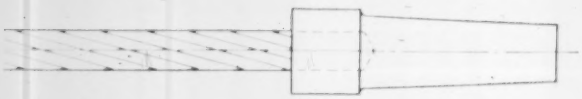


Swaging Success Stories

Visit the Torrington Booth 964 this week at the ASTE TOOL SHOW

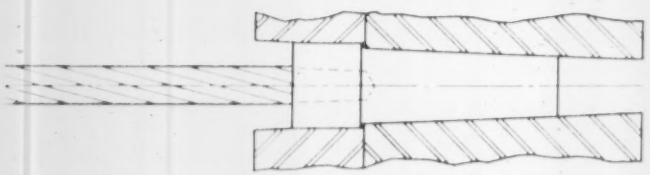


Cable Swaging... Clean, Quick, Economical



An electrical equipment manufacturer wanted a way to fasten terminals to cables—a way that would give perfect bonding—a way that was cleaner and faster than soldering or brazing.

Torrington's swaging experts showed him how to attach terminals to cables by one fast rotary swage.



Result: a clean, secure joint between cable and terminal, and accurate sizing of the plug end of the terminal at the same time.

Look at the savings that swaging can bring!

1. Savings in material and equipment—no solder, no brazing or dipping equipment needed.

2. Savings in labor—swaging can be done by unskilled personnel.

3. Savings in time—swaging is fast, clean and precise.

For more information on swaging as a method of bonding or reducing metals write for our informative booklet. It contains complete descriptions of the Torrington Rotary Swagers and may give you some ideas for a "swaging success story" in your own plant.

THE TORRINGTON COMPANY
Swager Department
150 North Street, Torrington, Conn.
Makers of Torrington Needle Bearings

TORRINGTON ROTARY SWAGING MACHINES

Serving in

M-47 tank accompanies U.S. infantry on training mission in Europe.

BY AMERICA'S FOREMOST PRODUCER

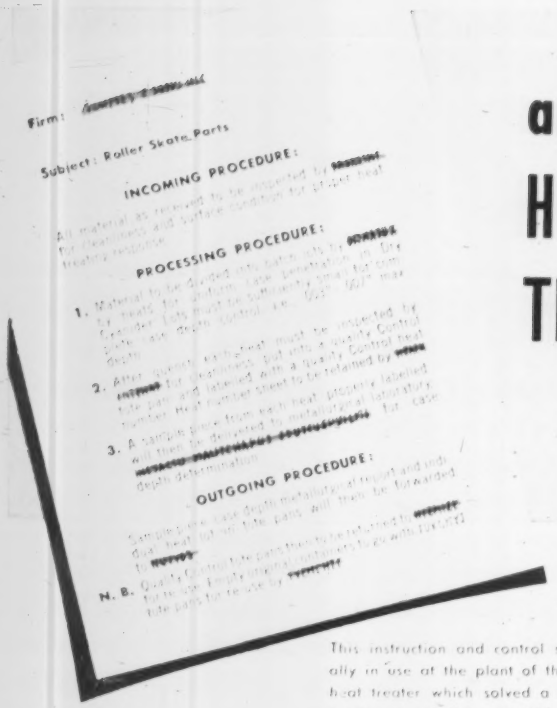
Wherever peace and security are threatened by aggressors you will find armored equipment made in the U.S.A. standing guard. Engineering and metallurgical "know-how," combined with mass production techniques common to this country alone are building an arsenal of defense for all the world.

Consider armor plate for tanks. Serving as key producer and coordinator for Ordnance armor plate programs has been a Standard Steel Spring assignment for years. Our talents have contributed mightily to the design and production of many tank components. The flexible handling of our unexcelled manufacturing facilities has expedited shipment of an impressive tonnage of flat, formed, fully machined parts to all major tank producers. *This program will continue* until all who challenge the free way of life are made to realize the futility of attack.

Standard Steel Spring Division

Armor Plate Office: **PENOBSCOT BUILDING, DETROIT, MICH.**

an example of HOW COMMERCIAL HEAT TREATING CAN HELP YOU


Firm:

Subject: Roller Skate Parts

INCOMING PROCEDURE:

PROCESSING PROCEDURE:

1.

2.

3.

OUTGOING PROCEDURE:

N. B.

This instruction and control sheet is actually in use at the plant of the commercial heat treater which solved a real problem for the manufacturer as told here.

Recently a manufacturer of roller skate parts encountered a great deal of difficulty in trying to find a source of heat treating for a particularly hard job. So serious was the problem that at one time consideration was given to installation of the necessary equipment at the manufacturer's plant. However, equipment would have cost over $20,000 plus the additional expense of labor, plant space, insurance, supplies, and above all, the metallurgical supervision required to control this intricate work properly.

The manufacturer turned to a local commercial heat treater to handle the work and even offered to install the required equipment. However, they were able to handle the job to the utmost satisfaction of the customer, using existing facilities.

The cyaniding operation involved required a case depth of 0.003" to 0.007". Samples of each batch processed are sent outside to a commercial metallurgical laboratory for inspection and testing. After OK, the parts and metallurgical report for each batch are shipped to the customer. The control sheet shown here is actually in use at the plant now doing the work and conveys some idea of the thoroughness to be expected from those commercial heat-treating plants which are members of the Metal Treating Institute."

A reprint of the article, "Heat Treaters Cite Short Cuts to More Effective Purchasing" is available from each of the companies listed. This handy reference will prove of value when ordering heat treating.

THERE'S A HEAT TREATING SPECIALIST NEAR YOUR PLANT

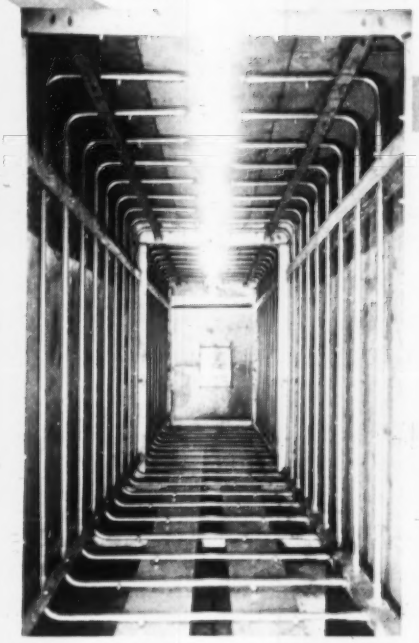
Ace Heat Treating Company
Elizabeth, New Jersey
Anderson Steel Treating Co.
Detroit, Michigan
Benedict-Miller, Inc.
Lyndhurst, New Jersey
California-Doran Heat Treating Co.
Los Angeles 23, California
Commercial Metal Treating, Inc.
Bridgeport, Conn.
Commercial Steel Treating Corp.
Detroit 4, Michigan
Cook Heat Treating Co. of Texas
Houston 11, Texas
The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio
Drever Company
Philadelphia 33, Pennsylvania
Greenman Steel Treating Company
Worcester 5, Massachusetts
Fred Heinzelman & Sons
New York 12, New York
Alfred Heller Heat Treating Co.
New York 7, New York
Hollywood Heat Treating Co.
Los Angeles 38, California
I-R Heat Treating Company
Newark, New Jersey
The Lakeside Steel Improvement Co.
Cleveland 14, Ohio
Metal Treating, Inc.
Milwaukee 4, Wisconsin
Metallurgical, Inc.
Minneapolis 7, Minnesota
Metallurgical, Inc.
Kansas City 8, Missouri
Metlab Company
Philadelphia 18, Pennsylvania
Metro Heat Treating Corp.
New York 14, New York
O. T. Muehlemeyer Heat Treating Co.
Rockford, Illinois
Nerl Heat Treating Corp.
South Bend, Indiana
New England Metallurgical Corp.
South Boston 27, Massachusetts
Paulo Products Company
Saint Louis 10, Missouri
Pearson Industrial Steel Treating
Chicago 50, Illinois
Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania
The Queen City Steel Treating Co.
Cincinnati 25, Ohio
Reliable Metallurgical Service, Inc.
Cleveland 11, Ohio
J. W. Rex Company
Lansdale, Pennsylvania
C. U. Scott & Son, Inc.
Rockford, Illinois
Stanley P. Rockwell Company
Hartford 5, Connecticut
Southern Metal Treating Co., Inc.
Birmingham 1, Ala.
Syracuse Heat Treating Corp.
Syracuse, New York
Vincent Steel Process Co.
Detroit 7, Michigan
Winton Heat Treating Company
Cleveland 16, Ohio

This advertisement sponsored by these Companies which are members of the Metal Treating Institute

MTI MASTER CRAFTSMEN METAL TREATING INSTITUTE

Winning New Friends Fast!

Carpenter Stainless No. 20 for SUPER CORROSION CONTROL of H_2SO_4



Sulphuric Acid Spray Booth fabricated from Carpenter Stainless No. 20 sheets and tubing.

It Completely Resists Attacks of Many Other Strong Agents

Now that this sulphuric-acid resisting stainless steel is again in free supply for unrestricted uses, why continue to put up with ordinary corrosion resistant materials in lines and equipment handling H_2SO_4 and other strongly corrosive agents?

Carpenter Stainless No. 20 stands up under corrosion's most vicious attacks long after the best of others have succumbed. A fast growing number of equipment manufacturers and processing plants are now switching to this super stainless for greater freedom from severe corrosion troubles, extended equipment life, reduced down-time for replacements, and lower costs chargeable to corrosion. You, too, will find that Carpenter Stainless No. 20 is best where corrosive conditions are worst.

In addition to its extraordinary resistance to H_2SO_4 and free sulphate ions up to boiling temperature, Carpenter No. 20 is *completely* resistant to a long list of other strong corrodents including:

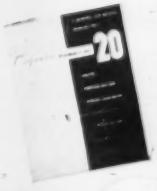
arsenic acid benzoic acid carbonic acid citric acid fatty acid picric acid mixed acids acetate solvents

Tubing, pipe, sheet, and plate of Carpenter No. 20 are available with columbium to facilitate fabrication by welding from . . .

The Carpenter Steel Company
Alloy Tube Division, Union, N.J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.
"CARSTEELCO"

Free Test Coupons will be sent for comparing No. 20 with other materials in your conditions. State type of equipment, corrosion conditions, temperature range, and other pertinent processing information relating to the job you have in mind for Carpenter No. 20. Request from your nearest Carpenter Representative or write direct to the mill.



Send for bulletin containing corrosion resistance properties, performance results, application and fabricating data.

For Carpenter 20 Bars, Strip and Wire Contact The Carpenter Steel Company, Reading, Pa.

Carpenter

STAINLESS TUBING & PIPE

Analysis · Tolerance · Finish

- guaranteed on every shipment

seamless or... welded?

Ryerson tubing experts help you select from world's largest stocks

Seamless or welded? Hot or cold rolled? Round or square? Whatever the type, size and wall thickness—you get what you need, quickly, when you call Ryerson for tubing.

That's because our tubing stocks are so large and diversified—are, in fact, the nation's largest. And because we have *a-tube-for-every-use* you can be sure of completely unbiased recommendations when you consult Ryerson specialists on tubing problems.

Other advantages of Ryerson tubing service: You deal with an organization that knows steel in all its forms and formulas, and you can save time by ordering every steel requirement from the same source.

You can rely on Ryerson for prompt personal attention—for quality steel accurately cut to specification—for quick delivery from stock. So, when you need tubing—and any other steel product—call Ryerson.

In stock: Bars, structurals, plates, sheets, tubing, alloys, stainless, reinforcing, machinery & tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL
April 26, 1954

Metalworking Outlook

Strength in Appliances

The market for major appliances shows surprising strength. This year's sales may not hit 1953's record $3.25 billion, but they could come close. Among major appliances, only electric refrigerators have a high percentage of saturation. Ninety per cent of the nation's electrified homes have them. The potential replacement market for that product is about 3,250,000 units a year, or almost $1 billion annually in retail sales, says Admiral Corp.'s W. C. Johnson, vice president-sales. Virgin markets remain in at least two other principal appliances. Only one of seven electrified homes has a freezer, and air conditioners have been sold to fewer than one out of 20 families.

Long-Term Confidence

Prudential Insurance Co. of America has confidence in metalworking. "Prudential is making more direct loans to metalworking corporations than it did last year," says Carrol M. Shanks, president. Prudential loaned $250-million to Chrysler Corp. earlier this year and plans more financing for industry. "There is no slump in long-term predictions, nor is there a slump in insurance sales," points out Mr. Shanks.

The Cities Will Spend

Public works will be a sizable economic bulwark over the next five years even if the federal government never spends a dime on such activity. Public Works Association says $5 billion will be spent for that purpose through 1958 by 141 municipalities surveyed. Highways will take the bulk of the outlays, followed by storm and sanitary sewerage projects, waterworks, schools and libraries, firehouses and city administration buildings.

A Matter of Size

Are you sizing your product to your market? A study by E. I. du Pont de Nemours & Co. shows that six out of ten households—25 million buying units—consist of three persons or less. If you make a consumer product, that fact has terrific significance. It accounts for the growth in apartment construction, the popularity of scaled-down appliances like small refrigerators and vacuum cleaners and probably contributes to the good sales of smaller cars like the Nash Rambler.

Wet Blanket in Washington

If the depreciation reform in the omnibus tax bill currently before Congress would be passed, Curtiss-Wright Corp. would be spending $10 million a year on new machine tools. That's just an example of the impact the old depreciation laws have on the economy. C-W has 6800 machine tools in its plants, 5300 of which were bought in early stages of World

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Metalworking Outlook

War II and some 60-65 per cent of which are government-owned. The company wants to modernize, but with its own money.

Drums and Telephones

New aluminum applications keep coming. Two of the latest are in chemical drums and highway telephone booths. The metal serves well in the drums because of its corrosion-resistance. About 190 pounds of aluminum go into each phone cubicle. Alcoa shipped its first last month.

Firm Pricing

Thinking of selling or buying a company? Society of Industrial Realtors says earnings, not company assets, should determine the sales price. The final price will probably average about five times annual earnings, but special circumstances could boost the figure to ten times earnings.

Psychology Pays Off

How do you pay your production employees? Associated Industries of Cleveland finds that the most common practice is to have the foreman hand out the checks to the men who work for him. Personnel people think that's good psychology. Another common procedure is to have some outside agency, such as Brink's Inc., handle the job. That's done particularly often when employees are paid in cash.

Straws in the Wind

Electric power capacity already at a record 257 billion kilowatt-hours will increase another 55 per cent within the next ten years, predicts Westinghouse Electric Corp.'s Vice President Tomlinson Fort . . . Budd Co. predicts capacity operations for its railway car facilities in 1954 . . . Raytheon Mfg. Co. plans a 6-million research program and new, more automatic production facilities for transistors . . . Final approval of the Nash-Hudson merger, now American Motors Corp., came late last week . . . The Air Force is considering storing excess machine tools in an abandoned limestone mine near New Castle, Pa.; Army Ordnance has already tried that type of storage successfully . . . Reflecting work-schedule improvement, Youngstown Sheet & Tube recently placed 700 "white collar" workers who had been on short work weeks back on 40-hour schedules.

This Week in Metalworking

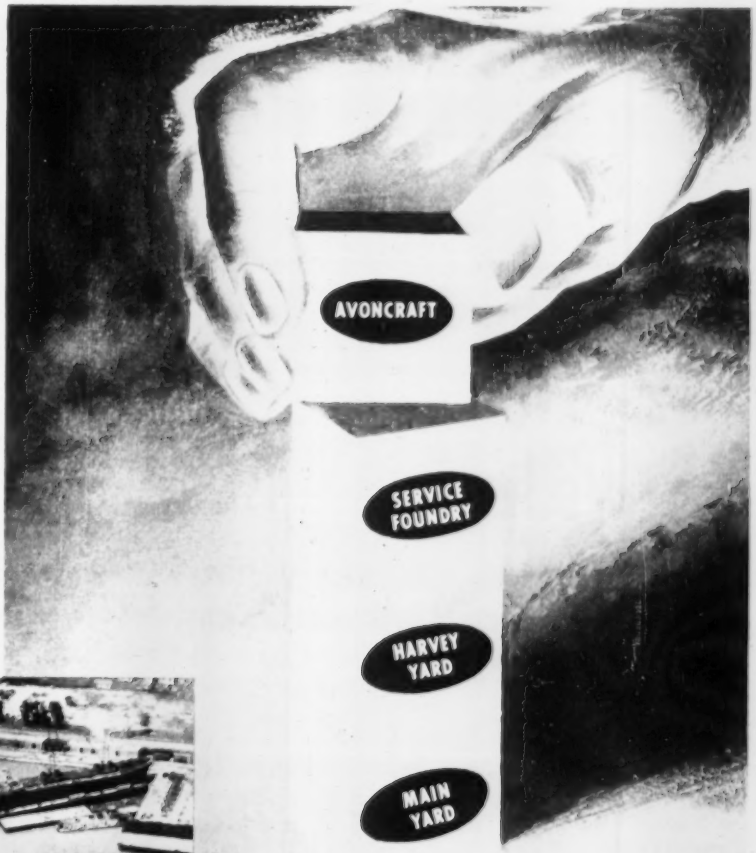
Office of Defense Mobilization has in the works a list of all-out war requirements that industry must meet (p. 55) . . . Steel kitchen cabinet makers aim for a potential 1-million-ton steel market (p. 58) . . . Welded wire fabric production is gaining as new applications develop (p. 60) . . . An Ohio project to ship emulsified coal by pipeline may result in lower power costs (p. 60) . . . Air freight cargoes mark sky-high gains as metalworking goes airborne (p. 62) . . . European steel production shows slight gains (p. 65) . . . To maintain its most valuable resource, manpower, industry is turning to college recruiting on a permanent basis (p. 66) . . . Great Lakes Steel makes the first readjustment in basic steel price (p. 59).

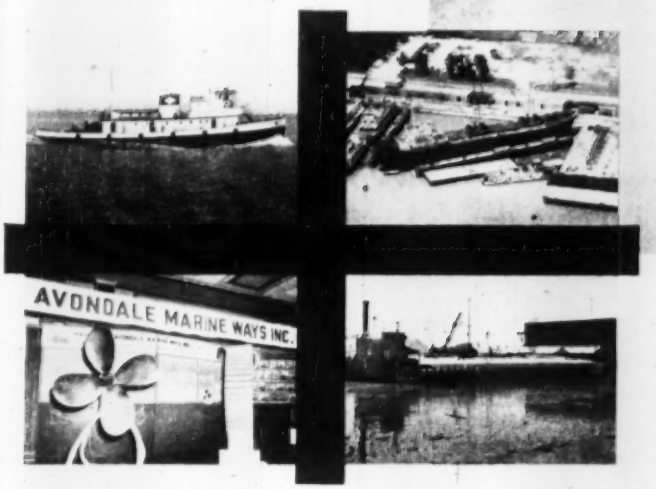
AVONDALE ADDS A 4th DIVISION

Now using more STEEL than ever before..

AVONCRAFT . . .
"Avondale's Salute to Steel"

Now . . . more than ever before, with the new Avoncraft Division joining Avondale's trio of industries —STEEL is Avondale's tool! This new division manufactures load-bearing walls, load-span decking and curtain walls for countless exterior and interior building uses. And more than ever, steel is the Avondale medium . . . for Avoncraft's products are made of steel, in one of its most recent and widely-accepted forms— architectural porcelain enamel. The new Avoncraft Division, which is located at Avondale, La., promises to be a truly great addition to the already famous Avondale industrial trio, and to the name and fame of STEEL!





MAIN YARD • Avondale, La. Ship and barge building and repairs, tank cleaning and steel fabrication.

HARVEY YARD • Harvey, La. Quick repairs, dry-docking, and propeller service.

SERVICE FOUNDRY • New Orleans, La. Iron, steel and non-ferrous castings, cut gears, and large capacity machine work.

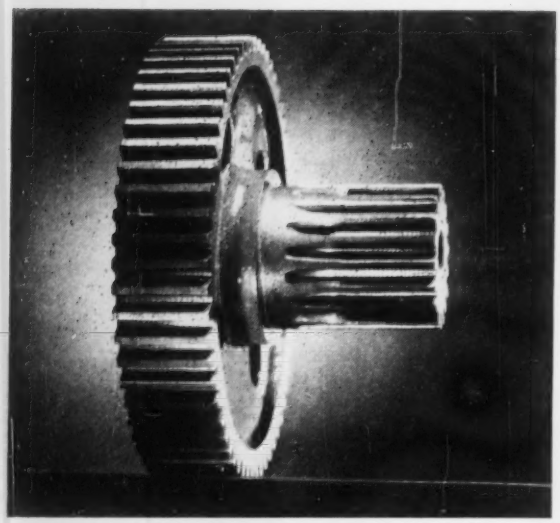
AVONCRAFT DIVISION • Architectural porcelain enamel on steel load-bearing walls, load-span decking and curtain walls.

SHIP BUILDING · SHIP REPAIRING · FOUNDERS · PROPELLERS · STRUCTURAL STEEL

AVONDALE MARINE WAYS, INC.

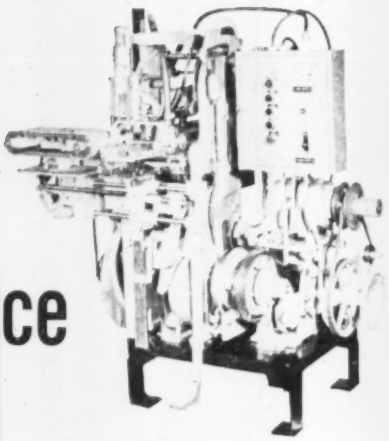
CABLE ADDRESS "AVONWAYS"

P. O. BOX 1030 • PHONE UNiversity 4561 • NEW ORLEANS 8, U. S. A.



Fit as a fiddle . . . aptly describes this Ductile Iron camshaft drive gear. It was installed in an automatic labeling machine on March 3, 1952, at Bestway Products, Inc., Rahway, N. J. Ductile Iron "as cast" provides high strength, resistance to wear and galling, with good notched endurance properties. Inspection of the gear on June 15, 1953, found it to be as good as new and it's still on the job.

12 TIMES Longer Service with Gears of Ductile Iron



Harmony in motion . . . is essential in the musical record business, where downtime of equipment stops deliveries with dire results. Look at this "Pony Label-Dri" automatic labeling machine, produced by New Jersey Machine Corporation, Hoboken, N. J. One of this type labels records for Bestway Products, often 'round the clock.

* * *

"You can't sell Christmas records in January."

That's the way Louis Quitoni, Plant Superintendent, of Bestway Products, Inc., put the problem when his labeling machine — geared for 1,000,000 records a month — kept breaking down.

Imagine the backlog that built up, and what happened to deliveries . . .

Until this Ductile Iron gear was installed.

"The latest gear . . . machined from a Ductile Iron casting," writes Bestway Products, "has given a truly remarkable performance."

The two principal requirements of this gear are 1) a high order of wear resistance and 2) ability to withstand sudden shock loads imposed by a knife clutch. This machine is intermittently operated and tripped 3 or 4 times a minute.

So far, Ductile Iron has given 12 times the service of high test iron gears which failed in about 2 *months*. So far the initial Ductile Iron replacement has served 2 *years*, and it's still on the job.

New Jersey Machine Corporation, builder of this machine, as a result of this service life has standardized on Ductile Iron for camshaft drive gears for original and replacement installation.

In plants from coast to coast, Ductile Iron is saving money at every turn. How? By its remarkable load carrying ability and wear resistance, combined with excellent castability, ready machinability and moderate cost.

Send us details of prospective uses. We'll gladly suggest a source of supply from some 100 authorized foundries now producing Ductile Iron under patent licenses. Request a list of available publications on Ductile Iron . . . mail the coupon now.

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

Please send me a list of publications on DUCTILE IRON.

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Company

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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

What Kind of War?

Speaking before the American Society of Newspaper Editors, Vice President Richard Nixon stressed the importance of preventing a Communist victory in Indo-China and hinted that if necessary American ground troops might be employed to halt further aggression. Immediately critics said that the commitment of American soldiers to an unpopular war in Asia was too serious a matter to be broached to the public by the way of an "off the cuff" report to newspaper editors.

Mr. Nixon's blunt statement brought Americans face to face with the gravity of the Asiatic mess more effectively than anything else that has happened to date. As a result, people are demanding that Washington come clean with every bit of information that bears on the Indo-China situation.

This demand to be alerted to possible danger could be something new in American history. On Sept. 19, 1931, Japanese invaded Mukden, Manchuria, on the pretense of a faked border incident. Henry Stimson warned of the danger, but others were complacent. On Oct. 2, 1935, Italy invaded Ethiopia. Some feeble protests were uttered, but no effective opposition developed. On Mar. 7, 1936, Hitler reoccupied the Rhineland in violation of the Versailles treaty, but nobody was sufficiently concerned to take effective action. Thus, by sheer apathy, the western world permitted an unopposed build-up for World War II.

In the late forties, Secretary Dean Acheson defined an area in the Pacific which the United States would defend against aggression. It did not include Korea. On June 24, 1950, Reds invaded South Korea.

Secretary of State Dulles, with the approval of President Eisenhower, is attempting to substitute a policy of firm resistance for that of appeasement that has failed dismally for 20 years.

Actions such as that of Vice President Nixon tend to give the individual American a stronger voice in national policy. If war must come, let it not be a Truman war as in Korea, nor an Eisenhower war as might develop in Indo-China, but a carefully considered war which alerted, well-informed American citizens are convinced is absolutely necessary.

E. L. Shaner

EDITOR-IN-CHIEF

LIVONIA FIRE COSTLY: Readers of the attractive and informative 64-page annual report of General Motors Corp. for 1953 probably were impressed with the candor with which management outlined the effect of the fire that destroyed the Hydra-Matic transmission plant at Livonia, Mich., on Aug. 12. After outlining in great detail the wonderful job which GM

personnel and suppliers performed in restoring production facilities in an amazingly brief period, management assesses the loss resulting from the fire.

It destroyed buildings, machinery, equipment and inventories having a gross book value of $35,600,000, which were carried at a net book value of $22,000,000. Cost of clearing the plant site brought the "total loss to an amount well in excess of the insurance recovery of $29,600,000."

But this wasn't all. The frantic efforts to restore production facilities at the earliest possible dates "brought" total costs to higher levels than would have been otherwise required. The net reduction in earnings on account of expenses attributable to the fire and charged to operations amounted to approximately $0.11 per share." On top of this, it is estimated there was a loss of production of about 100,000 cars as a result of the fire.

Indeed, Livonia undoubtedly is industry's most costly fire.

MANNA FROM HEAVEN: In thousands of metalworking plants the disposal of chips, turnings, etc., from machining operations is considered a routine headache—an unattractive chore to be performed daily for the sake of good plant housekeeping. The orthodox method is to deliver the waste metal to a point where private contractors can pick it up and carry it away. Some companies reclaim varying percentages of cutting oils by centrifuging, but in general much of this oil is lost.

One company, which had been following a rather haphazard policy in regard to waste disposal, decided to launch a carefully planned waste and oil disposal and reclamation program. It spent $79,000 for oil and chip handling equipment, excavations for underground conveyors and tanks (p. 116) and accessories. In the first 20 months this new system was in operation the company realized gross savings of $235,667. This is like manna from heaven, but how many manufacturers who could profit by following the example of this company will do so?

BREAKING THE CHIPS: Among readers of this page are industrial executives who early in their careers worked at lathe, shaper or other machine tools. They will remember the exciting difference encountered in the kinds of chips which followed the cutting tool. On some types of work, the chip would be in half-inch sections, about the size of one's thumb nail. On others, it might be a long, twisted piece of metal resembling a snake.

In those days, the individual machinist had some control over chips by the manner in which he ground his cutting tools. That control is still important, but instead of leaving it to the judgment of individual machinists, machine tool builders wisely have entrusted the problem of chip breaking to experts (p. 98) who have developed practices which should promote longer tool life, easier chip disposal, better machined surfaces and safer machine operation.

RECRUITING GRADUATES: Almost every metalworking company has had occasion to contact engineering schools and to talk with graduates in the hope of recruiting some of the best qualified applicants. Companies which pursue this policy year after year reap good dividends. In fact, the company that decides to take a certain number of engineering school graduates every year regardless of economic conditions at the moment is playing a smart game. It is establishing among professors and students a feeling that it is a reliable, substantial employer which can provide stability in employment and opportunity for advancement.

There are no set rules for recruiting engineering graduates (pp. 66, 67), but the manufacturer who explains his personnel problem to an understanding professor in most cases will be rewarded liberally.

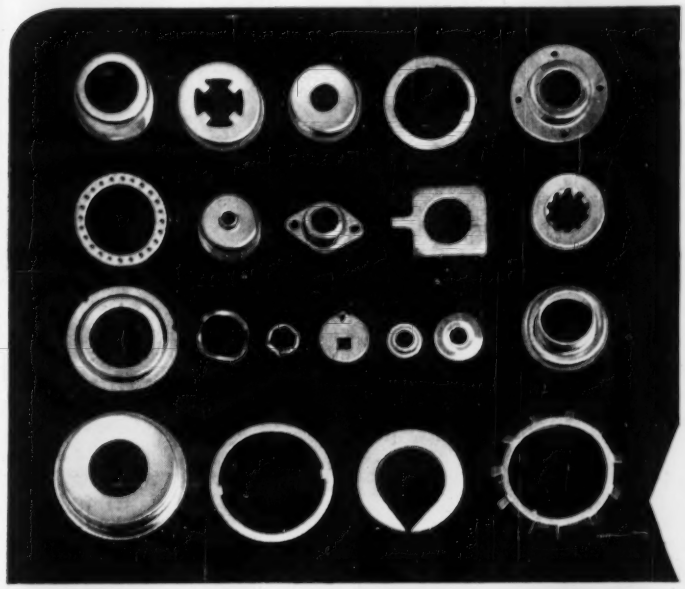
DISTRIBUTION BY PIPE: Last week it was announced that a pipeline may be laid between coal mines in southeastern Ohio and a big consumer on Lake Erie. Feasibility of conveying coal by pipeline (p. 60) has been tested thoroughly by a pilot installation. Beyond these tests, there is considerable experience to prove that many materials, when reduced to a sludge by the addition of water, can be pumped through pipes economically.

This contemplated project, sponsored by an enterprising coal company and an alert public utility, will be watched with interest by many who believe sensational methods of distribution are not too far off.

A Source You Can Rely on...
A Name to Remember

Experience is a valuable asset in the development, manufacture and distribution of any product. In this respect we offer you the cumulative benefits of *Continuous Service to Industry Since 1887* . . . including origination and pioneering of mass-production equipment for the economical manufacture of washers.

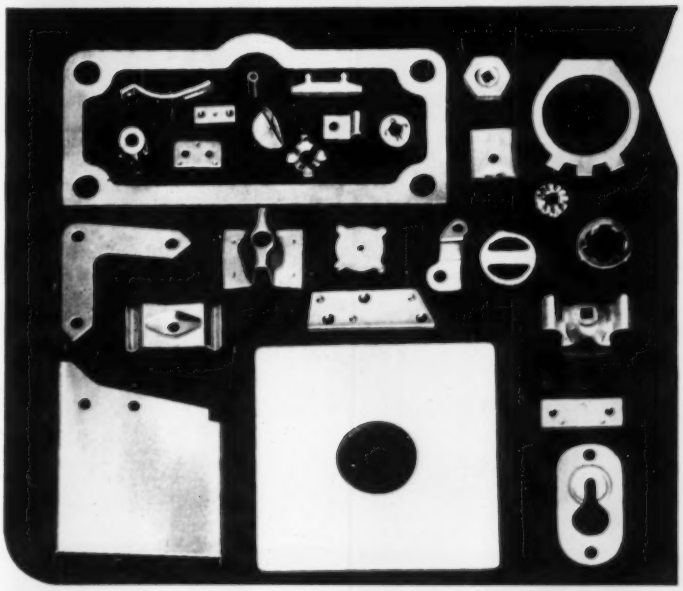
SINCE 1887



No matter what your washer requirements may be . . . whether for U. S. Standard Washers, SAE Washers, Rivet Washers, Lock Washers, Light Steel Washers, Finishing Washers, Machine Bushing Washers or Special Washers of any size, any desired material or finish . . . "MILWAUKEE WROT WASHERS" is the name to remember! Here, in the world's largest plant devoted to this specialized type of production, we have available more than 25,000 sets of dies — a priceless asset in providing the most complete and comprehensive selectivity to meet your needs.

Write for Catalog "30".

WASHERS



STAMPINGS

If it can be punched out of metal—if die-making ingenuity and tool-making facilities can provide the means for producing stampings to meet your production specifications; if the job can be handled most advantageously as a stamping—again, "MILWAUKEE WROT" is the name to remember. Here is a soundly established source of supply you can rely on — plus *Quality Standards* that are a source of pride to us, as manufacturers, and a source of satisfaction to our most discriminating customers. We'd like to serve you.

Let us quote on your requirements . . . covering fabrication in any material and in any finish. Furnished machined, heat-treated or surface-ground, as may be specified.

WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

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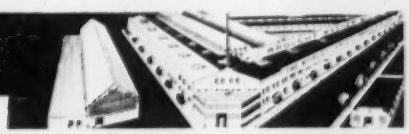


A 7885 IP

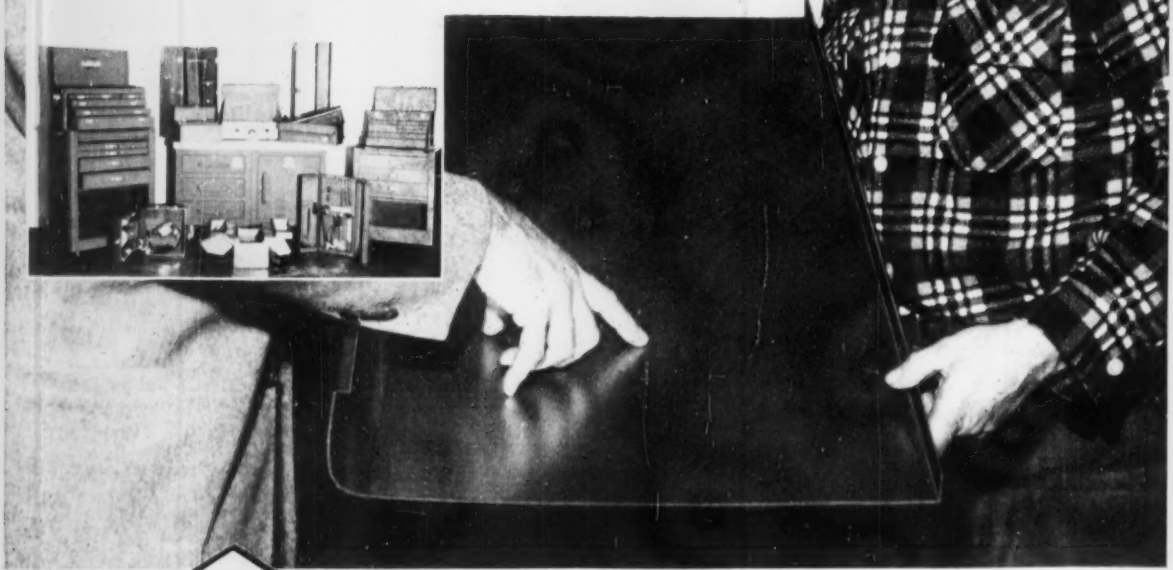
Another job done right with Inland **job-right** *cold rolled sheets*

Careful steel buying has helped Waterloo Valve Spring Compressor Company of Waterloo, Iowa become the No. 1 manufacturer of metal boxes and chests. They produce a product that's right, at a price that's right for giant retail chains and mail order houses. These outlets insist on uniformly strong and handsome tool, tackle and utility boxes. And Inland cold rolled sheets help keep these critical customers satisfied.

Steel "box-ing champ" gets an assist from Inland cold rolled sheets

Why not find out how Inland **job-right** *cold rolled sheets can help keep your production up, costs down and customers satisfied. Write today.*

"The right temper is our most important steel sheet requirement," says purchasing agent M. J. Karpan (left). "Sheets that are too hard spring back after bending. Softer sheets lack strength. And, of course, our sheets must be uniformly flat. For years, shipment after shipment of Inland cold rolled sheets have worked right for our jobs."



INLAND COLD ROLLED SHEETS

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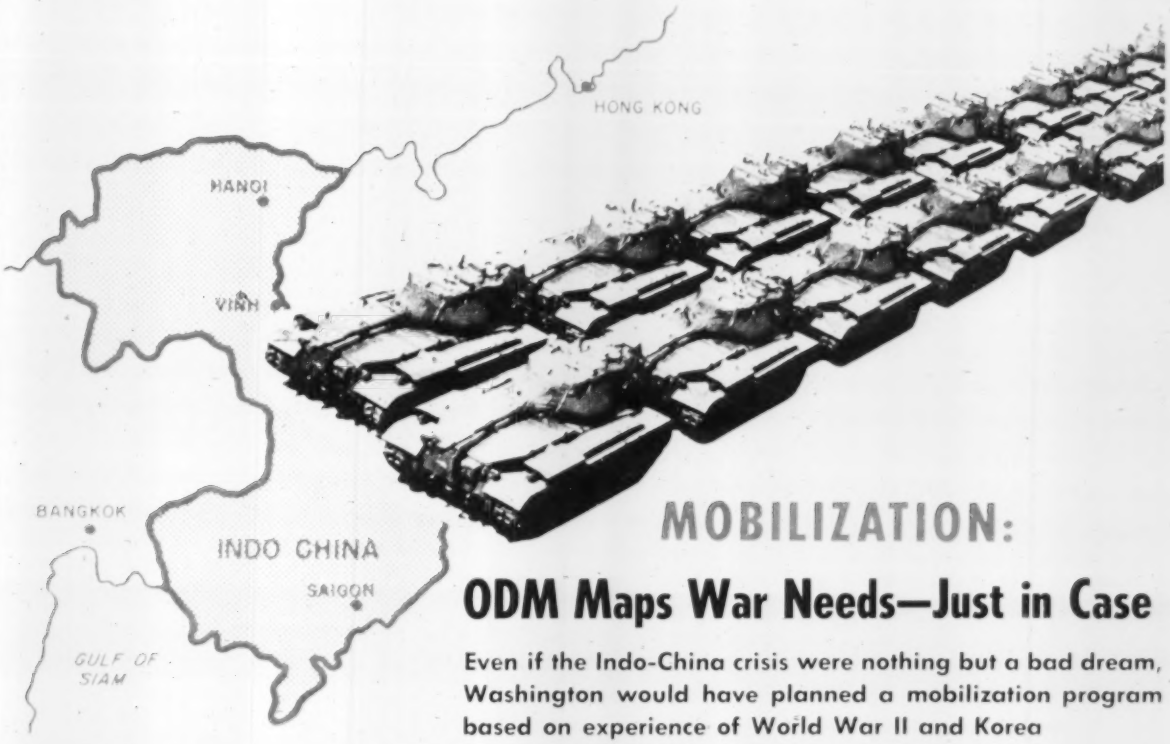


MOBILIZATION:

ODM Maps War Needs—Just in Case

Even if the Indo-China crisis were nothing but a bad dream, Washington would have planned a mobilization program based on experience of World War II and Korea

LOOK FOR big developments in mobilization planning in the second half.

Office of Defense Mobilization says it has long considered a complete survey of our military production position. A major step in the project will have been taken by "early summer." Even if the timing is accidental, the move assumes added significance because of Red gains in Indo-China.

Three Assumptions—By "early summer," ODM will have ready a list of military production requirements on and after M-Day. To come up with that list, the agency has had to make three principal assumptions: That M-Day will arrive next July 1, that M-Day will see unemployment at about the current level of 3 to 4 million and that M-Day will mark the start of a three-to-four-year global war. Everyone hopes those assumptions prove inaccurate, particularly the July 1 date, but the mobilizers had to start somewhere to prepare for any eventuality.

On the basis of the estimated requirements, ODM will consider:

1. Launching a new expansion program to fill indicated gaps in capacity.

2. Developing an arrangement whereby privately owned plants essential to the mobilization base but a liability to owners in peacetime can be maintained at government expense, at least in part.

3. Formulating plans to maintain minimum trained staffs at stand-by plants, to serve as nuclei for expanded organizations in time of war. (The Kyes plan is under consideration. It provides for experimental contracts to stand-by plants, in addition to the contracts for maintaining the tools and facilities.)

4. Creating a stockpile, other than the present raw material stockpile, to consist of tight components, mill shapes and items like x-ray film, surgical instruments and penicillin. (The new stockpile would probably carry, for example, 3-inch and thicker steel plates for high-pressure boilers.)

The Economics—Of the three assumptions on which ODM will base industrial mobilization planning, the most interesting is the unemployment of 3 to 4 million. Washington will count on that joblessness to enable the economy to step up military output in the early months without serious dislocation.

And the inference is plain that Washington would also count on unemployment to disappear rapidly. Total war is assumed, but a war confined to Indo-China would have much the same effect on unemployment. The Korean conflict did; it brought a three-year boom to the economy, with jobs at a record high and defense expenditures running for a time at $1 billion a week.

The Effects—What practical effects will this mobilization planning have on the economy, even if the status quo continues in world affairs? At this early date, you can foresee several developments. We need more shell-steel billets, but how much more depends on technical progress in cold extrusion. We need more capacity to roll 3-inch and thicker plates, required for production of

high-pressure boilers. A decision here will be determined by whether steam turbines, gas turbines or diesel engines get preference. There is an indicated need for facilities to produce certain carbon and alloy steel special shapes, large castings and forgings.

One likelihood will be that the supply of civilian steel will be "no greater than" the 1952 supply to civilian consumers in the first year of mobilization progressively less in subsequent years. Another is that the large amount of military building done recently and still under way will cut down construction needs in another war. Also, shipbuilding in another war would be considerably less than in World War II.

Handicap—The toughest problem facing mobilization planners is what to assume bomb damage will be in another war. Another intangible is the uncertainty as to how greatly war manpower needs have been reduced by new technologies and new weapons.

Even if we get no more seriously involved in Indo-China than we are now and even if the status quo continues in world affairs, this mobilization planning project serves notice that defense spending has become a virtually permanent part of our economy. Currently, spending for weapons is at an annual rate of $15.5 billion. That may drop somewhat, but a permanent mobilization policy indicates that it won't fall below $10-billion annually for years to come.

Forging Study Under Way

A study of the U. S. steel forging industry's ability to meet possible future defense needs will be carried out by two task groups representing the open die press and hammer forgers and the drop forgers. Appointed by the Business & Defense Services Administration, the task groups are organized as a subcommittee of the forging industry advisory committee.

Practically all of the 350 forge shops in the country expanded capacity during the Korean emergency, says BDSA. Industrymen estimate that no further expansions in capacity will be required unless further production innovations make them necessary.

Zinc Alloy Die Casting Shipments

(millions of pounds)

	1949	1950	1951	1952	1953
Job Shops	232	340	292	266	344
Captive Shops	144	194	160	140	168
Total	376	534	452	406	512

Zinc: A Try at Dime-Store Strategy

Zinc industry will help promote die casting. Reasoning behind the move: "We'll get our share of the increase even though other metals will benefit too"

THE ZINC INDUSTRY is adopting a time-tested dime store technique to get a multimillion-dollar sales payoff.

You've noticed how dime stores cluster together in a downtown area. Their theory is that they don't take business away from one another, but that their numbers tend to attract customers.

The Premise — Similarly, the American Zinc Institute is engaged with the American Die Casting Institute in a seven-point 1954 program to promote use of die castings. The program, announced at the Zinc Institute's 36th annual meeting in St. Louis last week, is premised on the thought that the way to expand sales of zinc die castings is to increase the total use of die castings whether they be made of zinc, aluminum or other material. The zinc people feel they would get their share of any increase.

Success of the program would pay off in millions of dollars, for die casters are the second largest users of zinc. Largest outlet for zinc is galvanizing. In 1953, die casters' sales of zinc die castings totaled 512 million pounds, David Laine, secretary, American Die Casting Institute, reports. At 10 cents a pound the zinc used in them represented around $50 million.

The Program—The joint promotion program, revealed by Mr. Laine, comprises:

1. A movie produced and paid for by AZI showing all types of die castings and all metals used for them.

2. A booklet giving die casting facts to designers, purchasers and engineers.

3. A publicity program in 25 trade publications to promote zinc die castings.

4. Sponsorship of die casting exhibits by ADCI in connection with showings of the movie.

5. Special film presentations sponsored by the zinc institute.

6. Speakers bureaus formed by the die casting institute to provide experienced die casting personnel for each showing of the film.

7. Advertising and publicity announcing planned presentations of the film to groups.

Plus Factor—Not only is the zinc institute co-operating with the die casting institute, but it is expanding its zinc promotion program generally. It is aggressively seeking to hold the present markets for zinc and at the same time develop new uses.

Defense Spending Falls Short

Defense department expenditure statistics show at least a partial reason for the drop in steel demand. Total department expenditures, exclusive of foreign aid and purely civil work, came to $9.6 billion in January, February, March, 1954, an annual rate of $38.4 billion. This compares with $11.5 billion in April, May, June, 1953, an annual rate of $46 billion.

The department continues to estimate expenditures in the fiscal year ending June 30, 1954, as $41.6-billion, but expectations now are that actual spending will be below that estimate.

Eagle-Picher Co.

Use of Lead in the United States*

(In Thousands of Tons)

PURPOSE	1952	1953
White lead	21	20
Red lead and Litharge	65	66
Storage batteries	330	373
Cable covering	146	149
Building§	57	62
Tetraethyl	148	153
Ammunition	24	38
Foil	3	5
Bearing metal	29	30
Solder	65	66
Typemetal	25	26
Calking	46	44
Other uses	142	113
Totals	1,101	1,150

* Includes antimonial lead. † Exclusive of oxides for storage batteries. § Chiefly pipe, sheet and extrusions.

Current Trends Bring Optimism in Lead

These factors give producers hope for million-ton year: Sales and prices have turned upward in past two months, imports have declined, inventories are low

OPTIMISM in lead is again ballooning.

Since the heavy metal tilted sharply upward in both sales and price in the past eight weeks, belief has grown that the pyramided problems of overexpansion and top-heavy imports that glutted the market and dragged down the price are now under control.

Outlook—Add to that the cheerful consumption forecasts from major users at the 26th Annual Meeting of Lead Industries Association last week in Chicago. For more than a decade lead consumption has stood at about 1 million tons yearly. In 1954 it may be off about 10 per cent from 1953, but that year was the fourth highest in history.

Batterymakers now account for 32 per cent of total lead consumption. Following are tetraethyl 15 per cent, cable 13 per cent, construction 10 per cent, solder 6 per cent, paint 4 per cent, printing 2 per cent, railroads 1 per cent, and all others 17 per cent. Battery consumption of lead has grown consistently; gasoline has sharply increased. Solder was also sharply upward until 1948 but has flattened out since. Lead in the paint and railroad industries shows consistent downward trends; in construction it has been markedly stable and in printing and cable more erratic.

Trends—Pegging 1954 consumption for their product at 364,000 tons, batterymakers predict more lead will go into replacement batteries, less into original equipment and industrial and government batteries. Lead men are watching closely developments in vitreous enamels for aluminum. No enamel has been found with proper temperature characteristics without using lead; about 4 pounds of metallic lead is used for each 100 square feet of building signs, road signs or decorative paneling.

Lead markets have been active in recent weeks, as consumers generally have less than 30 days supply. Producers are in good shape to furnish the metal: Their stocks of refined, about 100,000 tons, are highest since 1949.

Foreign Impact—Imports last year averaged about 45,000 tons monthly and competed strongly with domestic mines and secondary smelters, who turned out close to 65,000 tons monthly. Result was a 12-per-cent cut in domestic mine output. Stocks accumulated abroad are now less cumbersome, and European demand has strengthened, resulting in a 30-per-cent lower first-quarter import rate.

Promise of renewed stockpile buying has also buttressed the market, contributing to a 1.5-cent price rise since early March. Lead now costs 14 cents a pound, New York basis, compared to a former ceiling price of 19 cents and a post-Korea low of 12 cents.

Carboloy Cuts Prices

Price cuts averaging 10 per cent on cemented carbide blanks and 5 per cent on standard tools and dies were announced by Carboloy Department of General Electric Co., Detroit.

Finished solid, cemented carbide mechanically held inserts will be reduced up to 30 per cent. Not affected by the price changes are Carboloy's new grade 370 cemented carbide, diamond dressers and masonry drills.

ODM Extends Expansion Goals

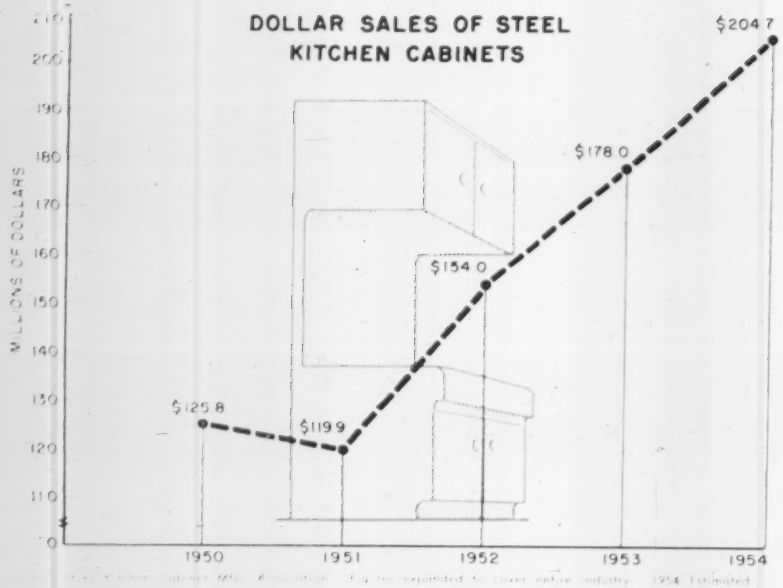
Office of Defense Mobilization has extended the time limitations for six expansion goals in the transportation field to Dec. 31, 1954. That means construction must begin on equipment or facilities for those goals by that date in order to be eligible for fast tax write-off.

Transportation goals affected are: Freight cars, diesel locomotives, specified types of inland waterway vessels, Great Lakes ore carriers, railroad terminal and road facilities, and refrigerated warehouse and storage facilities.

U.S. Steel Gets Tax Speedup

U. S. Steel Corp. received the largest certificate of necessity for accelerated tax amortization issued by Office of Defense Mobilization in the two weeks from Mar. 25 to Apr. 7. The certificate was for metallurgical coke facilities, $70,636,000 with 45 per cent allowed. The company also received a certificate for metallurgical coal, $7,800,000 with 60 per cent allowed.

Other recipients are: Great Lakes Steel Corp. for coke facilities, $2,214,000 for 50 per cent allowed, and Aluminum Co. of America for aluminum forgings, $3,000,000 with 85 per cent allowed.



Steel Cabinet Makers Sell Steel

Sales outlook for steel kitchen cabinets is up for 1954. But sales could climb much higher if the industry's program to sell steel as a cabinet material goes over

STEEL KITCHEN cabinet manufacturers are out to capture a bigger piece of a potential million-ton-a-year steel cabinet market in 1954.

Makers of steel kitchen cabinets figure they collectively consume about 250,000 tons of steel a year now. Steel cabinets get only 25 per cent of the entire cabinet market. The rest goes to wood.

Rally Round—So these manufacturers, shooting for at least 50 per cent of this potential million-ton market, are rallying round their trade association, the Steel Kitchen Cabinet Manufacturers Association. The association has a program under way to sell steel as a cabinet material first; manufacturers are to tie in their own advertising efforts to sell their particular product later.

To sell steel, the association will point to its ruggedness, durability, cleanliness, nonwarping qualities and noncorrosive qualities.

Cost Factor—Steel cabinet makers say their product is competitive with wood when all the factors of assembly, installation and upkeep are considered. One manufacturer tells of a big apartment house job in which steel cabinets saved $100,000 in labor costs because a complete kitchen could be installed in 20 to 25 minutes.

This "sell steel first" campaign has almost 100 per cent support of the steel cabinet industry. The 21 firms in SKCMA do about 90 per cent of the industry's business; the 15 to 20 companies outside the association split the rest.

Natural Growth — The outlook for the steel cabinet industry is good in 1954. This year should see a continued growth of 10 to 15 per cent in dollar sales to about $204 million (see the chart), following the good years in '51, '52 and '53. If the "sell steel first" campaign catches fire, dollar sales could easily jump by 20 per cent in 1954 over 1953.

It's not all easy going for steel cabinet manufacturers, though. The same appliances that have done the most to condition Mrs. Housewife to the advantages of steel are now bringing color to milady's kitchen. Most steel cabinet manufacturers would prefer to sell nothing but white cabinets because colored cabinets present big problems in manufacturing and warehousing. One example: If the X Stove Co.'s stove is one shade of green and the Y Stove Co.'s stove is a slightly different shade of green, how can the cabinet manufacturer be sure his cabinets will match or compliment both shades?

Headaches in Color—Steel cabinet makers say it would be better for Mrs. Housewife to have white cabinets and add color in wall paint and curtains which could be changed quickly and easily. But, this problem is surmountable and several manufacturers now offer steel cabinets in color.

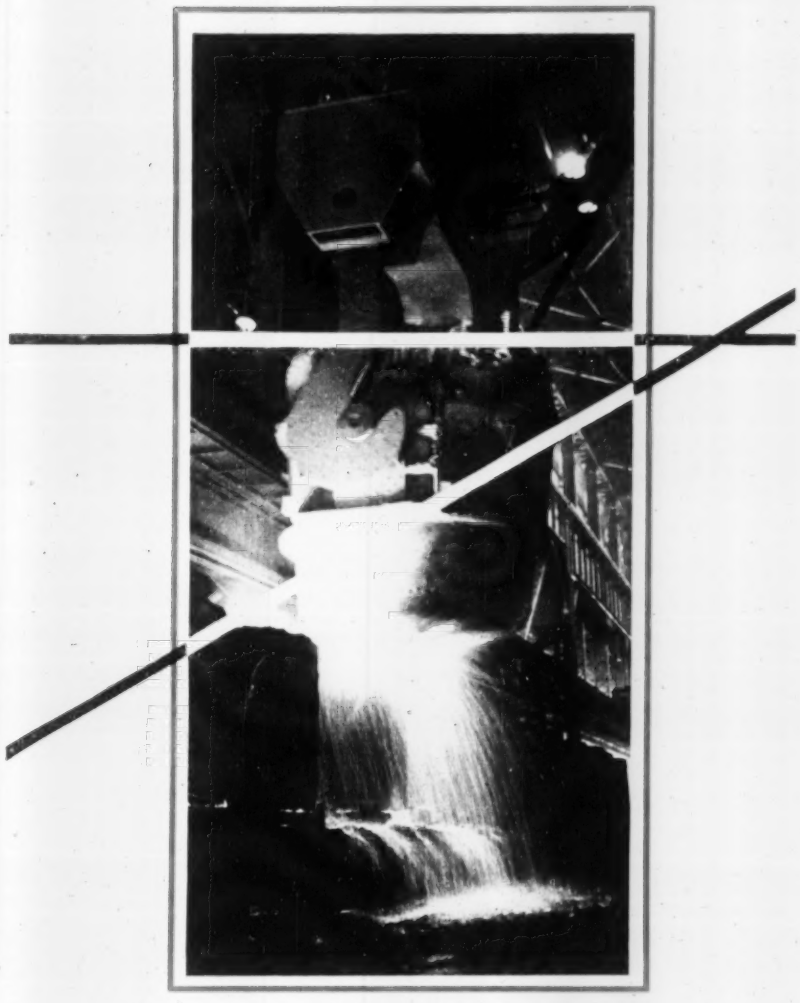
Another problem revolves around built-ins. Stove people are busy selling the American market on built-in ovens and ranges but they haven't standardized on any particular sizes yet. Someday they probably will; in the meantime the steel cabinet manufacturer has the problem of what sizes of cabinets to build to keep a maximum of the built-in kitchen market.

Still Competitive — Up to now, the remodeling market has accounted for nearly 70 per cent of steel cabinet sales even though the new construction market is estimated as ten times as large. Chances are this year emphasis will be more equally divided between the two. Slothful dealers will undoubtedly be weeded out. Advertising and promotion plans are the heaviest in years. Part of dealer promotion bangs on this point: Dealers get a full 40 per cent discount on steel kitchen cabinets; that's no longer available on most other appliances.

One Hundred Thousand Jobs

Postwar expansion in the steel industry, including expenditure of over $5.6 billion, created facilities for at least 100,000 more workers than the industry employed in 1946, according to American Iron & Steel Institute.

Employment in the industry averaged about 683,000 in 1953, compared to 575,000 in 1946 (figures do not include iron and coal miners). This rise in average monthly employment is slightly greater than the simultaneous rise of 17.6 per cent in all manufacturing industries.



Steel's "Break-Even Point"— 60%?

WHERE is the steel industry's "break-even point" today?

With steelworks operations hovering in the high sixties, this question rivals the guaranteed annual wage as a topic for luncheon table conversations.

Major steel producers don't know the answer. Most of them haven't reached it yet, although many are too close for comfort.

The majority estimates the break-even point now is close to 60 per cent of a vastly expanded capacity. Ninety per cent of estimates obtained in a STEEL survey are in either the 55-60 or 60-65 per cent brackets. A few are higher; a few are lower. But 60 per cent appears to be the median.

Many Variables — Not only do break-even points vary from company to company but they vary within any company from month to month. They rise and fall with fluctuations in material costs, labor costs and product-mix changes.

Guesses on the break-even points now are generally 5 to 10 points below what they were a year ago. This drop is caused largely by lower prices for scrap and the reduction in overtime labor rates.

Freight absorption, now more prevalent, tends to shove the break-even up by reducing the realized per ton revenue.

Product Mix—The large number of special items produced confuses the issue. Some specialty products return a good profit even at a low rate of operations. Most major producers also operate fabricating divisions. Often these are more profitable than steelmaking operations. One major producer reports a satisfactory profit over-all for first quarter, but believes its steelmaking operations are near the break-even point.

Above Prewar — Today's estimates are substantially higher than those of prewar times.

In 1938, E. G. Grace of Bethlehem figured his company could make money operating at 35 to 40 per cent of capacity.

National Steel's E. T. Weir told the Temporary National Economic Committee in 1939 that the industry should be able to operate profitably at about 35 per cent of capacity.

In 1940, Ben Fairless told TNEC that U. S. Steel would break even at about 50 per cent of capacity.

Great Lakes Cuts Prices $1

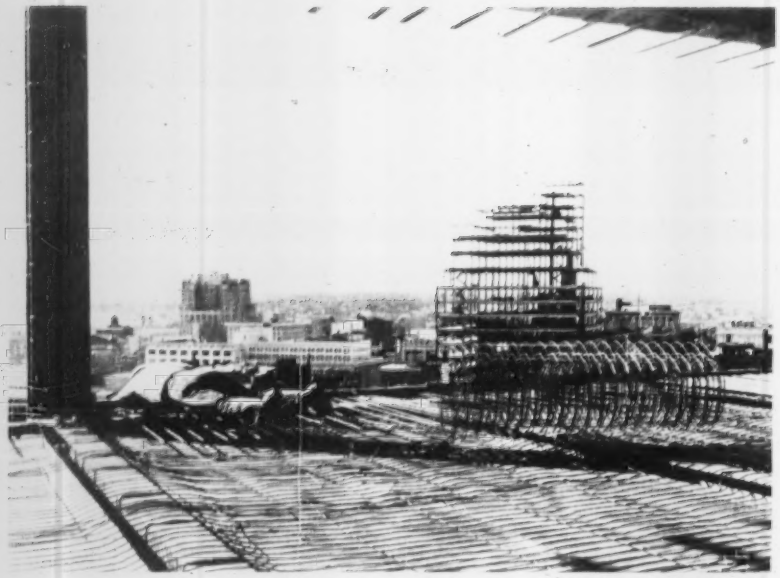
Reduction of $1 per ton in mill base prices on products of Great Lakes Steel Corp., Detroit, was announced last week by National Steel Corp. of which Great Lakes is a subsidiary.

The new prices are: Carbon hot-rolled strip, $4.075 per 100 pounds; carbon cold-rolled strip, $5.60; NAX hot-rolled strip, $6.10; NAX cold-rolled strip, $8.30; carbon hot-rolled sheets, $4.075; carbon cold-rolled sheets, $4.925; NAX hot-rolled sheets, $6.050; NAX cold-rolled sheets, $7.375; carbon hot-rolled bars, $4.30; alloy hot-rolled bars, $5.025; NAX hot-rolled bars, $6.375; carbon plates, $4.250; NAX plates, $6.40.

Best February in 46 Years

"We have had the best February in the 46 years Connors has been in business," says B. C. Blake, vice president and general manager of Connors Steel Division of H. K. Porter Co. Inc., Birmingham. "Our first quarter results will show that we are operating at virtual capacity."

Connors manufactures concrete reinforcing bars, hot-rolled merchant sections and special sections. Engineering and fabricating facilities for reinforcing bars are also maintained.



Wire Reinforcement Institute Inc.

Sky-high construction outlays promise a . . .

Good Year Ahead for Welded Wire Fabric

Sharpening sales tactics, individual producers are stressing service and quality. Collectively, they're campaigning for wider range of uses

CURRENT CONSTRUCTION momentum is helping wire producers weave more attractive sales patterns in welded wire fabric.

Sparked by an aggressive promotion program by the Wire Reinforcement Institute Inc., the industry is aiming for as big a chunk of the construction outlay this year as possible. The targets are big: General construction is booming along at a record annual rate of $36 billion currently, and highway construction is expected to equal or top last year's $3.2 billion.

Record '54?—Welded wire fabric shipments totaled about 291,000 tons in 1952, according to Commerce department figures. WRI has not announced 1953's shipments, but Frank B. Brown, managing director, says that availability of more steel and new uses being found for wire fabric are steadily increasing sales. This year should be the best in history.

Wire fabric is used in practically every form of reinforced concrete construction: ground slabs, floors, roofs and walls in buildings; precast concrete products; concrete pipe; highways; canal linings; airport pavements; and similar applications.

The New—Most recent development in the use of wire fabric is in asphalt road construction, producers report. A lighter gage mesh than used in concrete highways is being tested in asphalt road building by several states.

Wire fabric is produced from cold-drawn steel wire of various gages which is electric-welded into mesh. Many spacing combinations of the mesh are possible and often longitudinal wires will be of a different gage than transverse wires.

Open Season—Following the construction industry pattern, wire fabric sales are seasonal, and the order rush is just now getting under way. First quarter reports indicate that sales are keeping pace with the like period last year.

The most repeated sales objective among the approximately 15 welded wire fabric producers is: "We've got to sell the value of welded wire reinforcement to the public." Key words customers hear are "service and quality." The combination should make this a good welded wire fabric sales year.

Coal By Pipeline

Freight savings in 110-mile Ohio project may mean cheaper power for industry

PIPELINE transportation is getting set to add new impetus to the nation's industrial scene.

Last week Pittsburgh Consolidation Coal Co., Pittsburgh, and Cleveland Electric Illuminating Co. announced a proposed 110-mile pipeline to carry coal. Prospects anticipated: Cheaper industrial electricity because of a 40-per-cent savings over current coal freight rates.

Ready To Go—The multimillion dollar project is in the final planning stage. Pipeline will run from Cadiz, O., mines of Pittsburgh Consolidation to CEI's Eastlake plant. Capacity of the pipeline, which will move the coal in a 50 per cent pulverized coal and 50 per cent water mixture, is 1.2 million tons annually. Actual construction may begin this summer.

CEI, which has been conducting an aggressive industry-attraction campaign, says it now has new campaign ammunition. Many large industrial electricity purchasers have their rate contract tied to an escalator-type clause which fluctuates with the price of coal. CEI officials say that 40 to 45 per cent of the current cost of coal is for freight transportation. Estimates indicate that a savings of $1.25 per ton of coal will be possible with the pipeline transportation. Current coal rail freight rates are $3.07 per ton, CEI reports.

Test Line—Pittsburgh Consolidation has been working on the project several years and has turned its research data over to a large engineering firm for review. The firm has handled many large oil and gas pipeline undertakings. A test pipeline with a capacity of 7000 tons daily has been in operation in Cadiz.

The proposed pipeline will be constructed probably of 11-inch pipe. A pressure of 1000 pounds per square inch is contemplated to push the coal-water mixture. Two booster pumping stations will be constructed to maintain line pressure.

Legal O. K.—No legal obstacles

such as were encountered by proponents of the proposed conveyor belt project of several years ago are expected. Officials report that 1951 legislation by the Ohio Legislature clears the legal path. Right-of-ways will be purchased in the same fashion as done by oil and gas companies.

Puts the Squeeze on Costs

Allegheny Ludlum cites cost savings in new applications of hot extrusion process

EXTRUSION of stainless steel jet engine rings may prove to be one of the most important new applications of the hot extrusion department at Allegheny Ludlum Steel Corp.'s Watervliet, N. Y., plant.

The hot extrusion process can produce real cost advantages in greater yield per pound of shape in many complicated high alloy special steel sections, says Allegheny Ludlum. The extrusion operation reduces the generation of scrap in many cases and may greatly reduce machining time on parts.

Small Orders—The process also is adaptable for small quantity orders. Mills generally are not anxious to take orders for less than 10 tons of a rollable shape to be produced on a rolling mill. Problems on the rolling mill include both the lost production time for roll changes and the expense of cutting special rolls. Unequal angles, with varying angularity, are produced in this manner.

Hot extrusion, on the other hand, can be set up for a relatively small die cost. There's little production loss involved in changing over from one shape to another on the press.

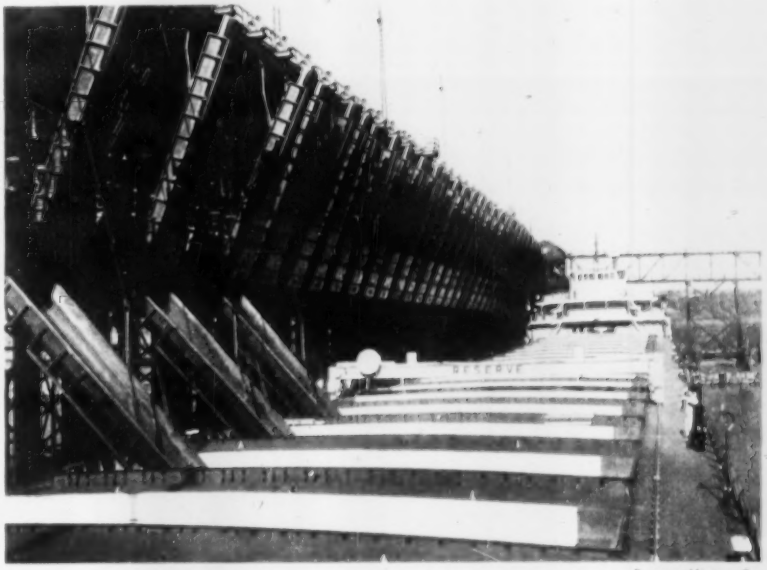
Allegheny Ludlum is now hot extruding a considerable number of different cross sections for jet engine use. For example, aircraft chain links are being extruded in figure "8" shapes, cut into sections of the desired thickness and drilled at each end to make the links.

Extruded Cans — Another section in development outside the aircraft industry is one for use in making tin cans. Extruded of two pieces of Type 316 stainless steel, the sections are joined to make a cylinder in which cans are received and soldered. The part has previously been made of carbon steel which needs to be machined, polished and chrome plated. Only finish machining of the extrusion is contemplated, and it is expected to have much greater life.

Inside Story—Comparisons have been made by Allegheny Ludlum of the grain structure of specimens of the same sections as rolled and as extruded. Grain structures in the extruded material compares favorably with that of rolled material, and there have been no major problems with segregation.

Alloy grades being made into shapes at Allegheny Ludlum's Watervliet, N. Y., plant include 405, 410, 403, 430, 303C, 304, 321, 310 as well as a variety of tool steels.

The company expects markets to develop in extruded shapes of high temperature superalloys, titanium and zirconium. Small quantities have been extruded on the present equipment.



Reserve Mining Co.

18,000 tons of taconite pellets start the trip south as . . .

Reserve Ships First Full Boatload of Taconite

THE FIRST large boatload of taconite pellets to be shipped by Reserve Mining Co. arrived in the Columbia Transportation Co.'s *Reserve* at Toledo, O., Apr. 19. Loaded later in the week was another 18,000-ton load in the *Armco*.

These boatload shipments are bringing down the accumulated pile up of taconite pellets processed by Reserve Mining's plant at Babbitt, Minn., over the winter. Only the smaller commercial plant is yet in operation at Babbitt, though a larger commercial plant is expected to be in opefation by 1956.

Progress Story — Contracts for the plant and site development of Erie Mining Co.'s commercial taconite processing plant at Aurora, Minn., have been let, and contracts for harbor development and rail facilities from the plant to the harbor are expected to be awarded soon. Erie Mining projects operation of its commercial plant at Aurora for 1957.

Reserve Mining Co. is owned by Republic Steel Corp. and Armco Steel Corp. Erie Mining Co.'s ownership is split up among Bethlehem Steel Corp., Youngstown Sheet & Tube Co., Interlake Iron Corp. and Steel Co. of Canada Ltd. Pickands Mather & Co. operates the Erie Mining plant.

Combined Output—Together, the two large-scale projects of Reserve Mining and Erie Mining, when completed could provide over 20 million tons annually of concentrate pellets containing up to 64 per cent iron.

By E. C. KREUTZBERG Washington Editor

Towmotor Corp.

Metalworking Goes Airborne as Air Freight Makes Giant Gains

SHIPMENTS of freight by air have more than tripled since the last war, and use of air express service has doubled. Commerce department statistics show air freight carried by domestic airlines came to 286,448,000 ton-miles in 1953 as compared with 82,593,000 in 1946. Air express business came to 43,470,000 ton-miles in 1953 as compared with 23,677,000 in 1946. This is only about 1 10 of 1 per cent of the total domestic transportation burden, but as Secretary of Commerce Sinclair Weeks points out, "Air cargo is still in its infancy. The volume is growing consistently as more companies find use of this service pays."

Use of air freight is not economical or advantageous for transporting bulk materials like steel mill products, coal, raw chemicals and the like except in case of emergency. But it lends itself admirably to haulage of many finished parts or finished assemblies.

Recently a list of some 2000 items that now are shipped largely by air was compiled by the airlines. Of the commodities carried by air 18 per cent are auto parts, 17 per cent apparel, 14 per cent electrical goods, 9 per cent flowers and nursery stock, 6 per cent drugs, 5 per cent machinery, 4 per cent printed matter, 3 per cent aircraft parts, 24 per cent all other.

The Advantages . . .

Air cargo, where applicable, brings down costs of doing business. Used discriminately, it increases turnover, reduces inventories, lowers warehousing and packaging costs, cuts markdown losses, minimizes losses through obsolescence and deterioration and hastens penetration of new markets. For getting a machine with a damaged part back into operation there is nothing to compare with air service.

Of the advantages enjoyed through air transport of goods, the most spectacular are those in reducing the amount of inventory that has to be carried. Big savings have been achieved by eliminating warehouses that carried stocks and replacement parts.

A good illustration is the case of a large Michigan automobile manufacturer with assembly plants in different parts of the country. The bulk of parts is shipped by rail or truck to the assembly plants. Then, when the stock of certain parts falls below a 72-hour supply at any one of these plants, the needed parts are shipped by air.

Again, take the case of a Washington, D. C., agency of a high-priced automobile. This agency receives shipments from Detroit by rail and truck. In the old days, when a customer needed a fender of an odd color there was a delay of at least several days before factory shipment could be had. Today the agency teletypes a parts order each afternoon to Detroit; the parts are put on an airplane and arrive in Washington the next morning. The agency is able to cut its parts inventory by relying on this air service. A further saving is that parts do not have to be packaged as for other shipment.

The Rates . . .

Air freight rates are not unduly high, in fact they are competitive with the 100-pound rail express rates. Current air freight rates are based on 21 to 22 cents a ton-mile, with lower rates applying when necessary in order to get a revenue load to avoid coming back empty. Thus rates from the West Coast to the East often go as low as 16 to 17 cents a ton-mile. The domestic air express rate is 80 cents a ton-mile with a minimum charge of $2.50 a package.

MEET THE CINCINNATI

Here is the newest member of the Cincinnati Hydroform family . . . a 19" machine which provides manufacturers with facilities for producing parts from blanks up to 19" in diameter, having a maximum drawn depth of 8". Material thickness of the formed part can range up to ⅜" cold rolled steel. A maximum forming cavity pressure of 15,000 psi provides the same high degree of formability that is available in the 12" and 26" Hydroform machines. Many intricate shapes can be formed in one operation, as the percentage of reduction in the draw is far greater than is obtainable by conventional practice.

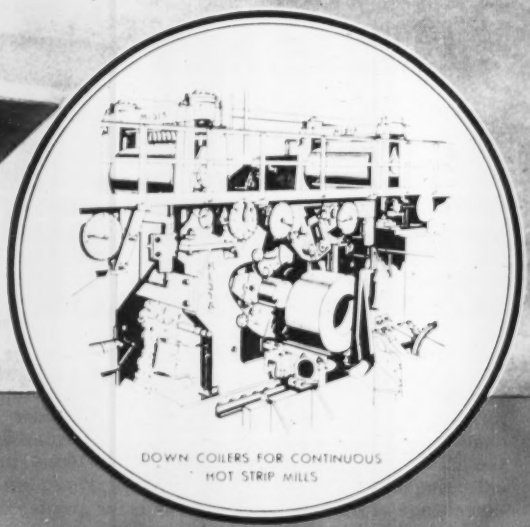
The hydraulic power unit for the 19" Hydroform is pit mounted to provide unobstructed floor space surrounding the machine. With this arrangement, the machine occupies an area only six feet square at floor level. Machine height above floor level is 11⅔ feet.

Since the introduction of Hydroforming, this revolutionary deep drawing process has been widely accepted. Now, Hydroform machines are being employed on an extremely broad range of development work and on short run and quantity production.

Is your company fully informed of the many Hydroforming advantages? Let a Cincinnati Milling field engineer give you complete details. For general Hydroform data and specifications of the 8", 12", 19", 23", 26" and 32" Hydroform machines, write for your copy of Bulletin M-1759-3.

CINCINNATI **Hydroform** THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

MESTA
HOT STRIP MILL



DOWN COILERS FOR CONTINUOUS HOT STRIP MILLS

Mesta 80" Four-High Continuous Hot Strip Mill

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY, Pittsburgh, Pa.

Upturn in European Steelmaking?

Some signs point to it. Britain and Germany are still optimistic though backlogs are about half of what they were a year ago. Even the ECSC feels the lift

SOME SIGNS are pointing to an upturn in European steelmaking operations.

New orders booked by European Coal and Steel Community member countries for rolled steel products amounted to 2,288,000 net tons in February, 1954, compared with 2,222,000 net tons a year earlier. March steel output in West Germany amounted to 1,496,000 tons compared with 1,320,000 tons in February, 1954. Germany's new order book jumped after some price concessions were made.

Strong Note—The British steel industry opened second quarter, 1954, on a strong note. After striking the highest weekly average output ever recorded for a January in that month this year 396,330 tons average weekly output dropped back only slightly to 392,920 tons in February and bounced back to 401,380 tons average weekly output in March, setting a new all-time record. There's still a six-month's backlog on heavy joists, sections and plates, mainly for the British home market.

Abroad, as in the U. S., competition is getting increasingly sharper, both for manufactured and semifinished metal products.

Competitive Cuts — In Latin America, for instance, a number of barter and extended-credit trade agreements have been concluded in the first quarter. And price cutting among European steelmakers continues. One report tells of Swedish mills shaving steel prices by $4.00 per metric ton. German steel mills have used ECSC bylaws, which provide that total incoming orders within a 60-day period may not deviate from official prices by more than 2.5 per cent, to grant some very healthy discounts on a few orders while keeping the total turnover within the 2.5 per cent limit.

While stressing the importance of these competitive factors, West German steelmen are now predicting an operating rate of between 75 and 80 per cent of capacity for the rest of 1954.

Unemployed Due to Imports

On Mar. 19, the Nation-Wide Committee of Industry, Agriculture and Labor on Import-Export Policy reported 274,500 U. S. workers were unemployed because of import competition. On Apr. 8 the figure of unemployed due to imports was revised upward to "at least 300,000." The committee's breakdown includes 500 persons unemployed in wood screw fabricating due to imports; 2400 in bicycle manufacturing; 700 in motorcycle manufacturing; 100 in scientific instrument making; 1000 in watch making; 10,000 in metal mining; 1000 in various phases of railroad equipment production; and 35,000 in coal mining. These figures all represent decreases in employment from February, 1953 to February, 1954.

Comments on Equipment

Do you have the impression that Japanese-built equipment is cheap and jerry-built and not reliable for an important industry like iron and steel making?

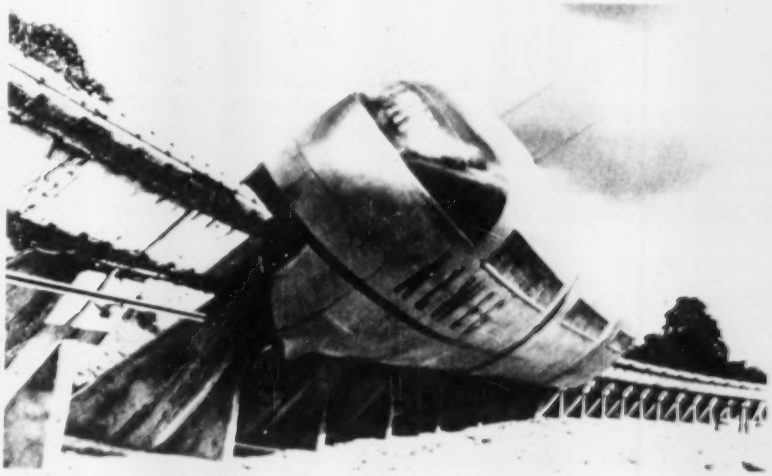
"I had the same impression before I went to Japan," said Phiroz Kutar, retiring president of the Indian Institute of Metals, at the seventh annual meeting of the institute in Calcutta. "But after inspecting their factories, I am convinced that the Japanese equipment is just as good and reliable as the equipment we buy from Europe and America. Their shops are well equipped with European and American machines, and they can produce goods to the specifications and tolerances laid down in Europe and America."

Some Export Business Booms

Business is better for some exporting U. S. companies.

Export of cash registers and adding machines by the Clary Multiplier Corp. has more than doubled in volume from a year ago, and March, 1954, was one of the best months in the company's overseas trade operations, J. S. Stallings, general manager, reports.

The improved dollar situation in most foreign countries has spurred a 20-per-cent increase in brewery and chemical equipment exports by Pfaulder Co. during first quarter, 1954, over the same period last year, says the company.



Los Angeles Looks at Swedish Whizzer

Dr. Axel L. Wenner-Gren, Swedish industrialist, claims his monorail system "Alweg," will cut the city of Los Angeles' new roadway costs by 30 per cent. This 40-per-cent scale model of "Alweg" has been clocked whizzing around a track in Cologne, Germany, at 90 mph. The system would cost $165 million

Monarch Machine Tool Co.

to recruit new talent

HAVE YOU been hiring your potential top men from whatever comes to the door?

The place to get the men with the highest potential is right at the colleges where they're turned out. The good men are seldom seen on the labor market once a company gets its hands on them, and though you run newspaper ads, you're getting the men left after other companies have already snagged the top candidates.

Your Choice—You may not be hiring whatever comes to the door, but that's what you've got to choose from if you don't have a college recruiting program.

Industry's total requirements for all types of college graduates is up 4.4 per cent this year over last. And last year industry met only 64 per cent of its engineering needs, 78 per cent of its accounting, 70 per cent of its sales and 79 per cent of its general business personnel needs, according to a study by Frank S. Endicott, Northwestern University.

Still Gaining — Up five times since the end of World War II, college recruiting by industry is still on the increase. The engineer shortage added impetus to the movement, of course, but companies who started recruiting as an emergency measure plan to keep it up even though their requirements may diminish in the future.

As one personnel officer expressed it, "Even though we may only need one or two men a year, we want them to be the best available. And who knows, one of those men may some day be the company president."

Too Expensive?—If yours is a small organization, you're probably saying, "It's all right for the big boys who can afford to go in for that sort of thing, but we can't compete with them."

Wrong. If you have something to offer the graduate and present it properly you may have an advantage over large companies as the guide on page 67 indicates. True, some large companies wine and dine candidates, fly them to their plants and have elaborate recruiting programs. But the soft-soap practice is tending to fall into disfavor with graduates who are more interested in job facts and the future, and it can create ill will through its connotation of bribery to the unsophisticated.

Actually the cost of recruiting a college man is estimated to lie on a range from $50 up to about $1500 dollars. Chances are your costs would be closer to $50, and even at $1500 the investment in a potential leader is worthwhile.

No Influence? — Maybe you've been disturbed by the fact that many large companies give money to colleges. First it should be pointed out that such gifts are of several types: Most common are gifts to alumni associations and building funds. About 1500 companies have special foundations or trusts to handle such gifts which are charitable in nature and unrelated to recruiting.

An interesting exception is the program of financial assistance established by Bethlehem Steel Co. on the principle of aid commensurate with value received. Under this program the company pays a university $3000 for each graduate recruited who stays with the company over four months. Some schools have turned down this program as putting an unfair burden on the graduate and college, others think it is an excellent idea.

Of recruiting significance is the program of scholarships which many companies have established.

Such scholarship programs are directly intended to encourage students to bring their talents into the firm's field of interest. These funds increase college capability and assist deserving students, help qualify students with competence to go into industrial areas in which personnel are needed and ultimately create a bigger pool of personnel.

Too Small?—Or perhaps you're frightened by the size of companies which recruit. One eminently successful recruiter is E. I. DuPont de Nemours & Co. which obtains about 75 per cent of its college trained people through recruiting. DuPont's college recruiting program has been operating over 25 years on a national scale, and it follows a continuous operation pattern even though personnel needs are low. At present it has about 12 people devoted to recruiting.

DuPont observes that competition is as great in college recruiting this year as last, though there is greater selectivity in actual hiring. However, typical of large recruiters, Du Pont feels that the small firm has an equally good chance in recruiting. Says L. A. Wetlaufer, "Small firms differ from large firms only in the extensiveness of their requirements. By confining their operations to a small local area, they can do as comprehensive a job as can companies with national programs."

So don't overlook the possibility of recruiting direct from the colleges, and don't assume that engineers are the only people recruited. A substantial number of people in business administration and liberal arts are employed by industry every year as well. And late last year the National Industrial Conference Board reported that over half of the firms it interviewed reported major recruiting of sales personnel is right on the campus, which is better than any other single source.

As competition stiffens the need for capable men is going to increase. That's where college recruiting will pay off for you. For when you get your men from the college direct, you have your pick of the crop.

HOW YOUR COMPANY SHOULD GO ABOUT RECRUITING COLLEGE GRADUATES

To learn if a college provides people with the training your job requires, phone or write the Director of Placement. Chances are if he can't supply your needs he will be able to refer you to the nearest school which can.

To attract applicants, first go to the school and talk to professors in the department of your interest. Have not only a concise story about the type of man you would like to hire and what you will require of him, but also be prepared to sell the professors on your company and its opportunities for graduates. This is important, for the professors in turn will pass the word along to students who often come to them for advice.

Placement office forms should be filled out while you're on campus. They include information about the type of job, salary, etc. Be explicit in your requirements and outline the job duties as fully as possible. And here's a point often overlooked: Be sure to tell just what it is your firm does, plans for future growth and opportunities you can offer the graduate. This will help set your firm apart from the normal job requisition request.

Students will be referred to you by the placement office. Most firms arrange to go to the campus to give several prospects their initial interviews in one or two days. During this preliminary screening, it's important to remember that students are being sold on your organization just as you're being sold on them. Be prepared with financial facts and figures, examples of what other graduates have achieved in your company, evidence indicating the stability of your organization and the soundness of its future.

Select the students you think are good prospects and arrange to have them visit your company at your expense. Show them your operations, and introduce them to the men with whom they will work. Plan time for unhurried interviews. At the end of a carefully planned visit, the company representatives who have talked with the man and observed him on a trip through the plant should be in a position to decide whether he is a good candidate.

IMPORTANT: Remember to approach college recruiting just like you would any other selling job. Selling your firm to the graduate is what college recruiting is, whether your firm is large or small.

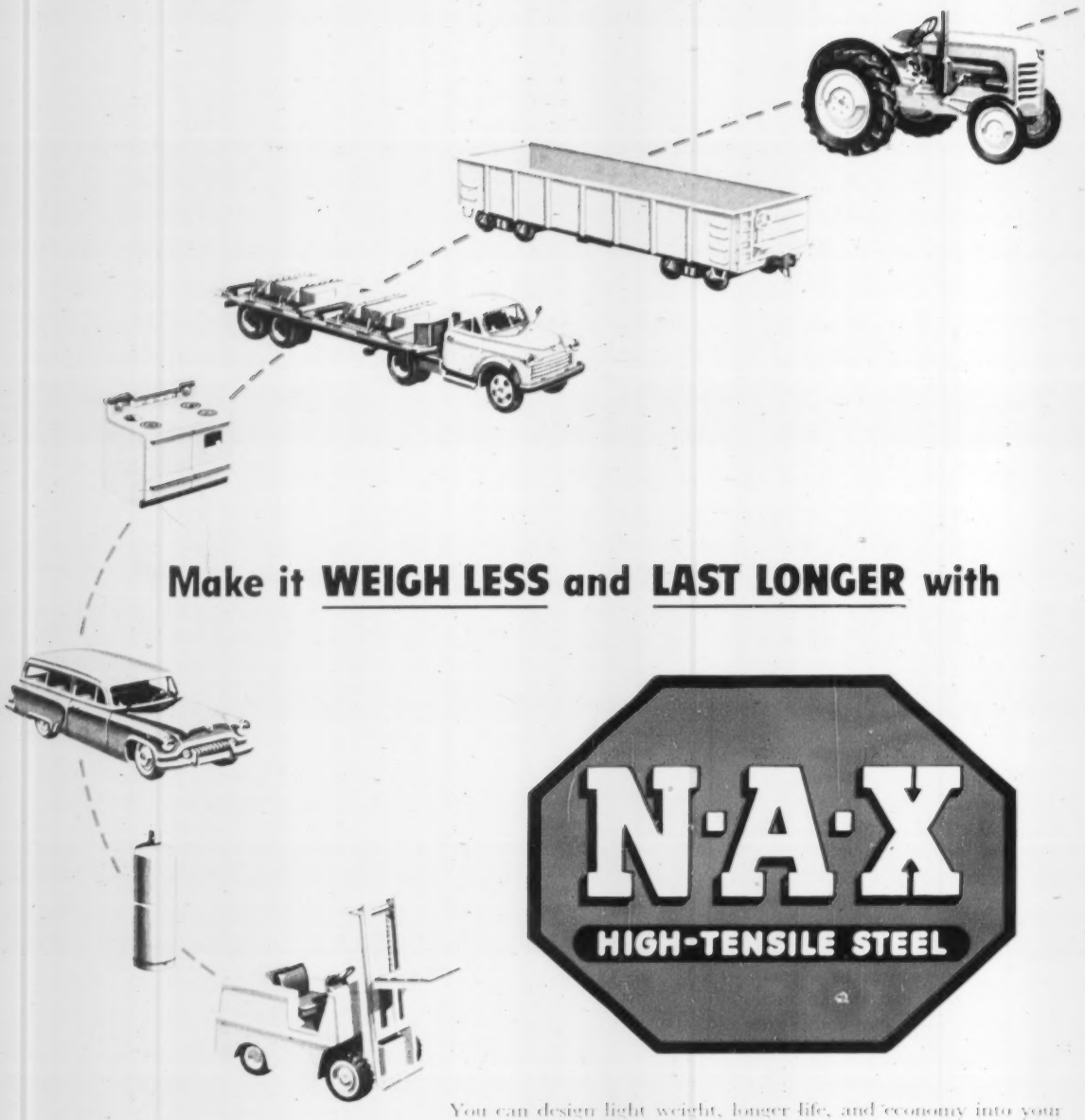
WHAT YOU AS A SMALL FIRM HAVE TO SELL

Recognition is a significant point. Graduates tend to fear being lost in a large organization. For that reason the big firms tend to concentrate on how achievements are recognized. But the small firm has the ready answer to that problem. With the intimate relationship of personnel and the responsibility each individual must share, the work of the man in your plant will be known to everyone.

Opportunity for advancement is really part of the same problem. Recognizing the man's achievement, the small firm is in a position to advance the deserving employee . . . if the opportunity is available. The small firm with plans for growth can paint a rosy picture of the opportunity available and the recognition necessary to achieve it. The larger firm, by contrast, must outline complex programs by which the man can only hope to reach the top.

Stability, of course, is what the larger firm can sell most adequately. This is an area the small firm must hit hard, emphasizing the time it has been in business, the growth of its sales, etc. The small firm with a definite growth program in mind and evidence that it is achieving that program need fear nothing on that score if it prepares its case carefully.

More varied and broader experience in a given field usually is a strong selling point for smaller firms. The graduate will readily recognize that smaller firms must give greater responsibility to each individual and thus provide an opportunity to broaden understanding quickly. This translates into the graduate's own increased value to your firm or possibly to another firm later on.



Make it **WEIGH LESS** and **LAST LONGER** with

N-A-X
HIGH-TENSILE STEEL

You can design light weight, longer life, and economy into your products by including N-A-X HIGH-TENSILE in your plans.

- It is 50% stronger than mild steel.
- It is considerably more resistant to corrosion.
- It has greater paint adhesion with less undercoat corrosion.
- It has high fatigue life with great toughness.
- It has greater resistance to abrasion or wear.
- It is readily and easily welded by any process.
- It polishes to a high lustre at minimum cost.

And with all these physical advantages over mild carbon steel—it can be cold formed as readily into the most difficult shaped stamping.

Sound like something for you? Ask for full facts and think of N-A-X HIGH-TENSILE when you re-design.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division • Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

Process Development Translates Dreams Into Cars at Lower Cost

DETROIT

DETROIT's dreamland dandies are the stylists. Air-brushing a future bright with chrome and wrap-around horizons, these vista virtuosos are commonly credited with making the Motor City move ahead.

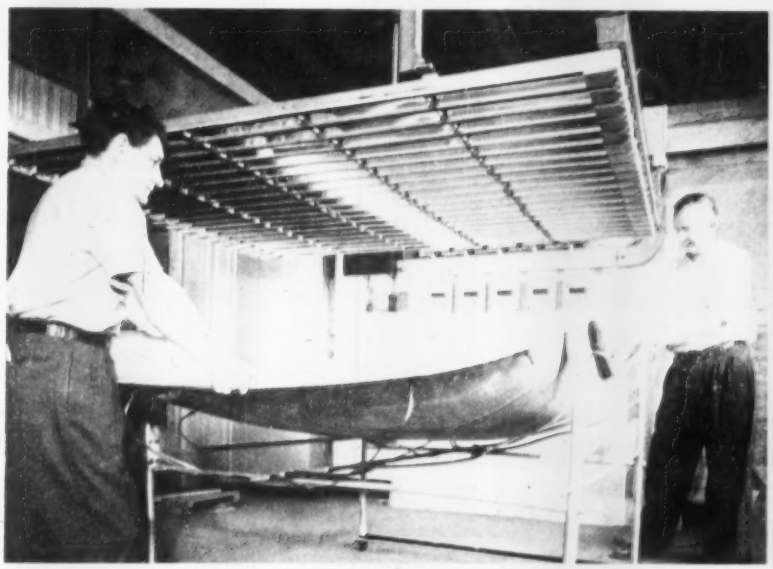
Although the tail-fin concept of progress should not be minimized, you can't drive an air-brush rendering. The car of the future must not only be built but must sell at a cost that people can afford. Today's Chevrolet would cost in excess of $25,000 if built by the methods used in the early thirties, and deflating a price tag like that takes plenty of dreaming along the lines of new manufacturing methods and processes.

Specialists in Tough Jobs — Much of this reverie realization is due to the familiar research team and the production engineer. But at General Motors there is a special group of production dream analysts known as the process development section. These are the boys that get the real toughies, the jobs that outside engineering and equipment firms won't touch and that divisional production people haven't the capacity to handle.

Established in 1946 as an activity of the manufacturing staff, process development fills an important and growing need at GM. For although divisions have their own process development people, they are frequently occupied with putting out everyday production fires. Thus they not only lack the time to work on long-range development, but in many cases they don't have the personnel or equipment either.

Useful, Unique — That's what makes process development useful as well as a unique and interesting place. Functioning as a contract consulting agency for GM's manufacturing divisions, process development takes the problem in manufacturing or assembly and follows it through to solution. The solution may be in the form of a new piece of equipment, often is in the form of a technical report. The section also offers consulting service performed right in the division's plant, sending a man out to investigate and make recommendations.

New equipment and new processes are also evaluated by the process development section, and often equipment is set up and put in operation to demonstrate it to division personnel. Experience



Plastic Skylight for Convertibles Has Built-in Shade

Experimental plastic top for convertibles allows car owner to have transparent or colored roof almost at will. The top, built by House of Plastics Inc., Cleveland, is actually two tops in one with one-sixty-fourth-inch space between. A pump fills this space with either clear or colored liquid. Infra-red radiant heaters and vacuum molds, left, form the 80 x 102 x ⅛-inch plastic sheets to required shape. Original was installed on a Chevrolet

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gained in working with allied problems of other GM divisions is another strong asset process development offers its General Motors clients.

Cutting 1955 Costs—That's why many of the new ideas you'll see cutting costs on the production lines in a year or two are taking shape today as pilot production equipment in process development.

But accomplishments the section has already achieved are indicative of things to come. Among others is a machine illustrative of inspection equipment which measures the thickness of dead-soft strip copper to .0001 inch at a rate of 300 feet per minute without touching the copper. An electronic head holds the secret of this machine as it does of another which inspects valve push rods for hardness without touching the part.

Nuts—An illustration of manufacturing process development involves die-cast carburetor bodies which must be deburred. Formerly a costly hand operation, experimental tests with various materials revealed that a stream of granulated walnut shells under high velocity would effectively remove the burrs without eroding the casting and a semiautomatic machine was built for the purpose.

A semiautomatic radiator cap assembly machine exemplifies assembly operations developments. Three of the five parts are fed automatically and assembled on the indexing carrier. The completed radiator cap is then functionally tested automatically at another station on the machine.

Develop Pilot Lines — Or take the development of pilot production lines. Before March, 1951, chrome-plated, cast-iron piston rings were used in diesel engines. Chrome-plated steel rings solved a breakage problem encountered in the engines in service but were prohibitively expensive. Process development entered the picture and found that round wire could not only be rolled into a rectangular cross section, but at the same time the necessary oil grooves could be rolled into one edge.

The rectangular wire could then be forced into circles and cut to length accurately. Other problems arose, however, in a method for grinding the rings perfectly round, developing special fixtures to prevent distortion during heat-treating and tempering, and depositing enough chromium on the outside of the ring in a reasonable period.

Suffice it to say that the project was completed successfully and that plating is now being done at a rate faster than is common in the decorative arts.

Charged in Motion—Another interesting project involves ammeter magnets. These small bits of metal are loaded into a hopper from which they fall freely a distance of about three or four feet. During that fall, the magnet is charged, the charge is read, the magnet is neutralized and depending on the reading the proper chute opens sorting the magnets into three pans.

Other interesting tid-bits cited by Director Glen R. Fitzgerald include a dozen semiautomatic assembly machines handling units ranging from ball bearing assemblies to carburetor subassemblies.

Growing—The growth of process development since its inception has been striking, and a new pinnacle will be reached when the section moves out to its new quarters at the GM Tech Center. With an office building of 78,872 sq ft and a shop building of 191,619 sq ft which includes an experimental foundry, the section will be able to increase its operations and personnel.

There, with styling, engineering and research, process development will continue its unheralded job of making Harry Horsepower's dream car come true.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,783

Week Ended	1954	1953
Mar. 20	154,895	169,923
Mar. 27	149,562	181,749
Apr. 3	146,498	170,567
Apr. 10	152,074	176,783
Apr. 17	149,389	162,171
Apr. 24	154,000*	194,610

Source: Ward's Automotive Reports.
*Estimated by STEEL.

Car of the Week

The plastic-roofed Sun Valley in the Mercury line this year seems to be moving in the direction of staying with us. This job is now snagging 4 per cent of Mercury production and is slated for an even bigger slice in the near future. And a week spent driving a Sun Valley gives a pretty good indication why.

All-Weather—A plastic roof is definitely pleasant in an expensive sort of way. In sunshine the car does not get warm and in snow the car does not get cold. And meanwhile that wide-open-spaces feeling is something to make a conventional job seem somewhat smothering by contrast.

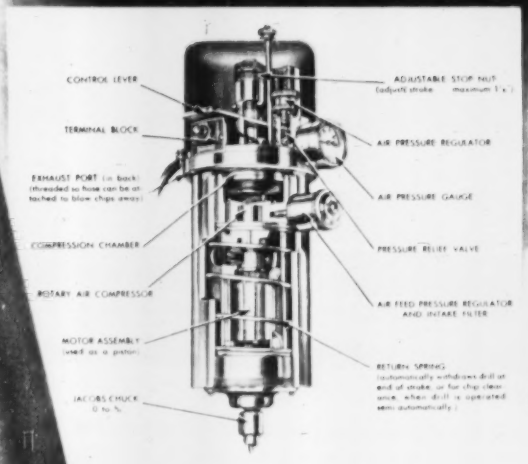
As to the car itself, it can perhaps best be described as a small Lincoln. If you recall, we had some nice things to say about the Lincoln handling last year. This car is much the same story this year what with the touted ball-joint suspension. There are other types of suspension still leading cars around, but in the Merc the ball joint unit does a nice job.

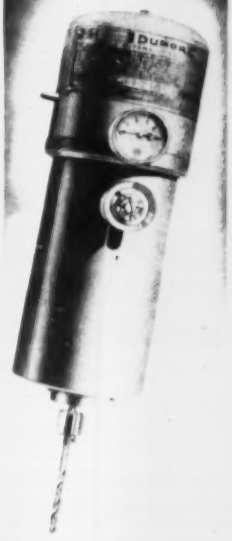
Performance Fact—Performance with Merc-o-matic is somewhat short of the bomb class, but still puts the car in fast company. With 160 hp doing the twisting, passing torque is excellent at medium and higher driving speeds contrasted with the somewhat slipful take-off.

Interiors in the Sun Valley were outstanding though comparison with other makes' four-door sedan species is impossible. Mercury retains its aircraft-type horizontal heater switches which is perhaps a harmless enough idiosyncrasy.

Compared with last year, this year the Mercury definitely went up.

DIE CAST OF ZINC


CONTROL LEVER
TERMINAL BLOCK
EXHAUST PORT (in back; threaded so hose can be attached to blow chips away)
COMPRESSION CHAMBER
ROTARY AIR COMPRESSOR
MOTOR ASSEMBLY (used as a piston)
JACOBS CHUCK 0 to ¼
ADJUSTABLE STOP NUT (adjusts stroke — maximum 1")
AIR PRESSURE REGULATOR
AIR PRESSURE GAUGE
PRESSURE RELIEF VALVE
AIR FEED PRESSURE REGULATOR AND INTAKE FILTER
RETURN SPRING (automatically withdraws drill at end of stroke, or for chip clearance when drill is operated semi-automatically)



for DUMORE

Here's Why.....

Since the above part is the largest single component of the pictured Dumore automatic drill head, the selection of material and process for its production was of paramount importance in achieving high efficiency and low cost of the finished product. The following factors dictated the choice of ZINC Die Casting:

Rapid Production—Because of the extreme complexity of shape and close tolerances attainable with ZINC Die Castings, an absolute minimum of secondary operations—burr removal, drilling, tapping, burnishing—are required to place this housing in service.

Low Cost Assembly—In addition to housing the entire motor assembly, compressor and return spring (see cutaway view), this hollow one-piece ZINC Die Casting has cored openings and cast projections to simplify assembly of all other operating components.

High Strength—A drill head comes in for a lot of abuse in its everyday usage and the inherent *toughness* of the ZINC Die Cast housing assures trouble-free performance of this machine tool under such conditions.

For many other instances of successful product engineering with ZINC Die Castings ask us—or any die casting company—for a copy of "The End Uses of Zinc Die Castings."

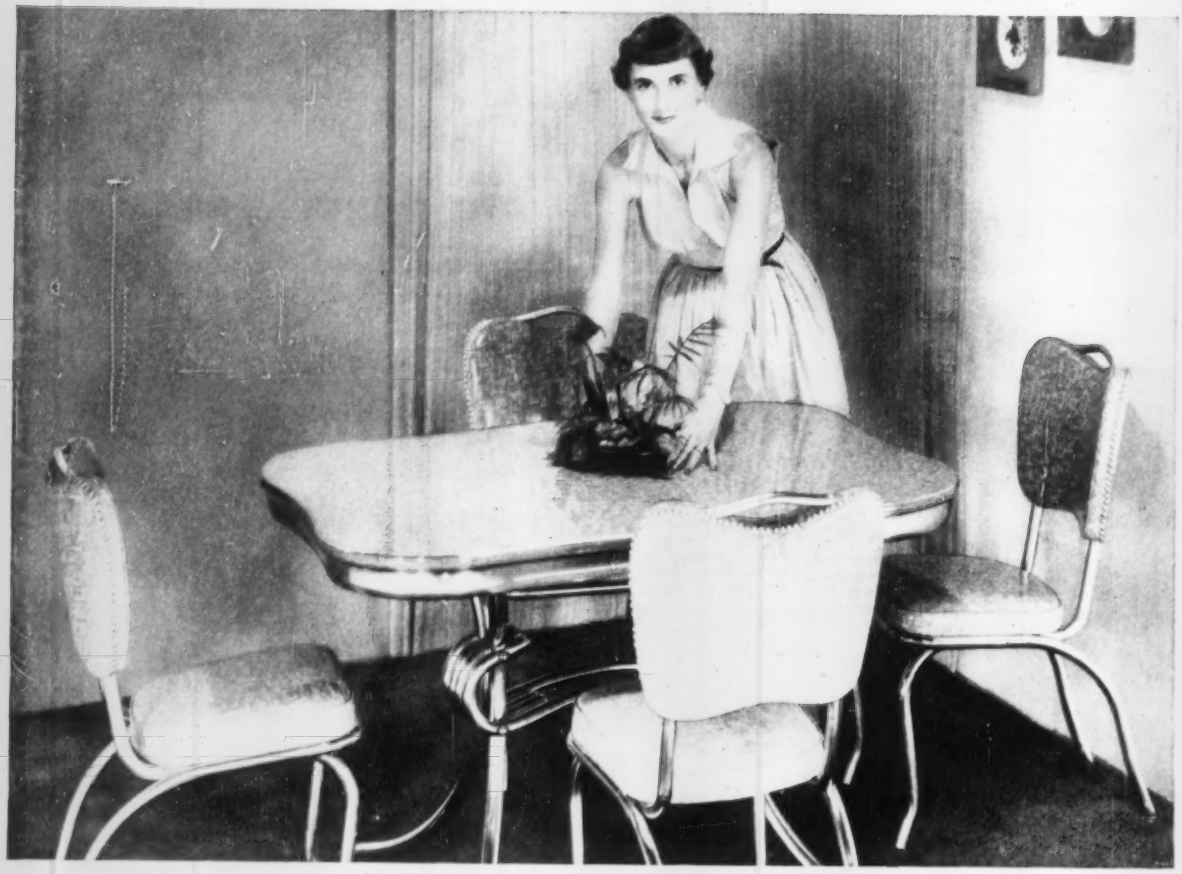
Send for your copy

The New Jersey Zinc Company
160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC



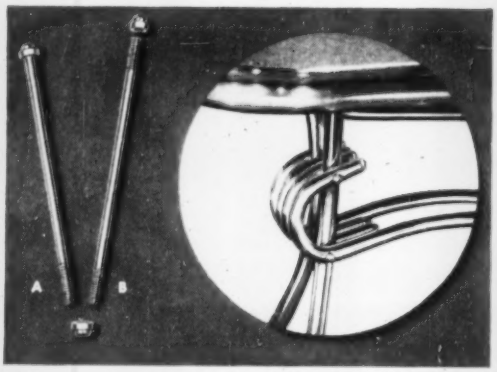
RB&W cold-forming pays off again

Virtue Brothers of Los Angeles sells a lot of these chrome dinette sets. They're good-looking, well-made, easy to keep looking like new.

However, Virtue Brothers believed assembly costs were running high. So they listened hard when an RB&W "fastener engineer" told them RB&W could cut by one-third their cost of buying and installing the steel studs with acorn nuts which hold the table legs together (see inset below).

And we did. By cold-forming an acorn head at one end of the 6-inch stud, RB&W eliminated one of the two separate nuts Virtue had been using. This halved assembly costs, as well as nut inventory. RB&W's cold-formed unit plus assembly runs $27.15 a thousand as against former costs of $41.00 a thousand — which works out to more than a pretty penny saved on a production-scale operation.

What an RB&W man did for Virtue Brothers, he can do for you. Because we make all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. Write RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y.



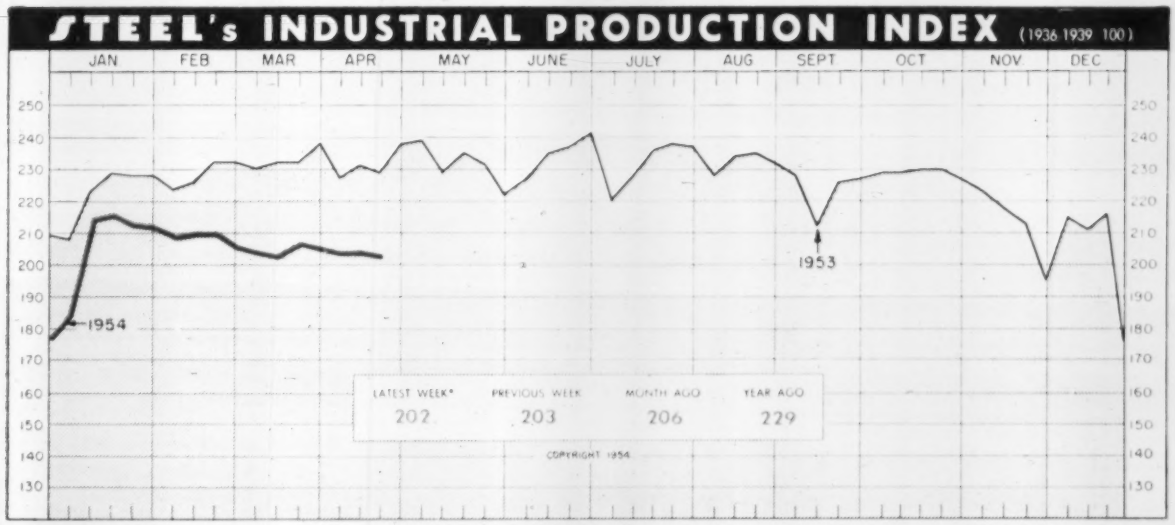
CUSTOMER'S REWARD was a one-third cost reduction when RB&W designed a cold-formed two-piece fastener (A) to replace the three-piece unit (B) formerly employed to secure table legs (right).

39

RB&W

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*



*Week ended Apr. 17. Based upon and weighted as follows: Steelmaking Operations 15%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

High Consumer Spending Slows Business Decline

CONSUMER SPENDING, buoyed by the high level of earning power, has helped stem the general business downturn. That's the view of Louis J. Paradiso, the Commerce department's chief statistician.

Mr. Paradiso points out that consumer outlays have held close to last year's peak level. During the March quarter consumer expenditures ran at an annual rate of $230 billion, only $1 billion below the record pace in the third quarter of 1953 and $2.3 billion above the rate in the January-March period of last year.

Consumer purchases were supported by near-record earning power. Personal income after taxes in the first three months was little changed from the $249 billion annual rate established in the third quarter of 1953.

Retail Purchases Slide . . .

Retail stores have not fared as well as other outlets in the race for the consumer's dollar. March sales are estimated at $13.3 billion by the Commerce department. Adjusted for seasonal factors and trading day differences, sales during the month were 2 per cent below February and 5 per cent below March, 1953.

Wholesale Volume Rises . . .

The moderate increase in wholesale trade volume during the past few weeks seems to indicate higher retail expectations. Metal summer furniture and television sets are being moved actively, Dun & Bradstreet says. Heavy competition is reported from many areas in television, washing machines and refrigerators.

Factory Sales To Improve . . .

Most manufacturers either expect sales to rise soon or are already experiencing a sales pickup. While sales and rentals of American Machine & Foundry Co. products during the March quarter were about 10 per cent below the similar period a year ago, Morehead P. Patterson, president, anticipates sales and rentals for the full year will be only from 5 to 10 per cent below 1953.

Harry M. Heckathorn, president, Mullins Mfg. Corp., says high distributor inventories of kitchen equipment are being reduced. This should be reflected in increased factory shipments during subsequent quarters.

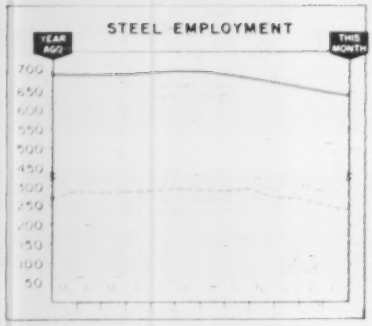
Farm equipment manufacturers, bolstered by particularly good sales in the corn belt, expect sales during the second quarter will exceed the first.

Already on the Upgrade . . .

I. W. Wilson, president, Aluminum Co. of America, believes we're now definitely on the upgrade. He says the sales pickup of his company follows a considerable drop in business since last fall a drop along with basic industry in general.

Good, and Getting Better . . .

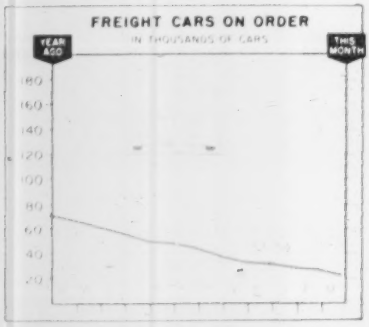
A most favorable first quarter is revealed by the air-conditioning division of General Electric. Orders and shipments for most lines during the three months were about double the 1953 period, relates F. J. VanPoppelin, divisional general manager. GE's spread-the-season purchase plan is partially responsible for this showing. The plan provides special prices, deferred payments and warehousing



Steel Employment, Payrolls

	in Thousands		in Millions	
	1954	1953	1954	1953
Jan	645	685	251.3	261.3
Feb	636	685	236.6	261.3
Mar		683		281.0
Apr		685		278.0
May		685		281.0
June		690		282.1
July		696		288.1
Aug		696		287.3
Sept		688		283.8
Oct		678		290.6
Nov		667		268.5
Dec		656		263.9

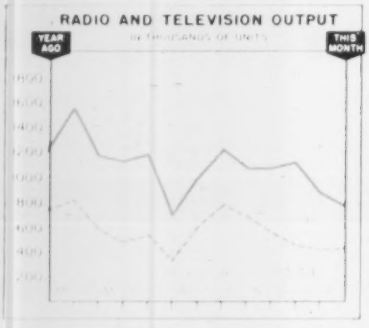
American Iron & Steel Institute



Freight Car Awards and Backlogs

	Awards		Backlogs	
	1954	1953	1954	1953
Jan	2,953	5,536	27,959	77,414
Feb	2,057	2,284	25,441	71,882
Mar	348	3,379	20,966	68,563
Apr		2,432		62,637
May		1,651		57,345
June		1,863		52,315
July		1,632		47,423
Aug		3,913		45,735
Sept		3,914		42,198
Oct		1,705		35,171
Nov		2,860		31,869
Dec		2,159		29,950
Total		32,928		

American Railway Car Institute

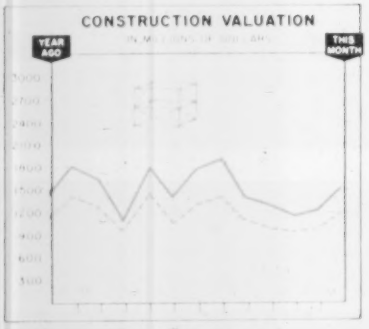


Radio and Television Output

Thousands of Units

	Radio		Television	
	1954	1953	1954	1953
Jan	572	1,093	421	719
Feb	569	1,192	427	731
Mar		1,549		810
Apr		1,159		565
May		1,109		482
June		1,704		524
July		974		316
Aug		992		604
Sept		1,237		776
Oct		1,052		680
Nov		1,066		560
Dec		1,101		450
Total		13,368		7,214

Radio Electronics Television Mfrs. Assn.



Construction Valuation

37 States; In Millions of Dollars

	Total		Building	
	1954	1953	1954	1953
Jan	1,151.5	1,075.9	935.6	876.0
Feb	1,221.3	1,021.3	977.5	792.9
Mar	1,527.5	1,323.5	1,199.8	1,054.4
Apr		1,741.5		1,354.2
May		1,606.1		1,219.8
June		1,115.5		922.3
July		1,793.3		1,417.8
Aug		1,414.4		1,053.4
Sept		1,741.7		1,290.7
Oct		1,892.4		1,392.7
Nov		1,394.1		1,096.9
Dec		1,279.8		973.8
Total		17,423.5		13,455.0

F. W. Dodge Corp.

Charts Copyright 1954 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Mar. 22	Ironers	Apr. 12	Refrigerators	Apr. 19
Employ., Metalwk	Apr. 5	Machine Tools	Mar. 8	Steel Castings	Mar. 15
Fab. Struc. Steel	Apr. 19	Malleable Castings	Mar. 15	Steel Forgings	Mar. 8
Foundry Equip.	Apr. 5	Prices, Consumer	Mar. 22	Steel Shipments	Apr. 12
Furnaces, Indus.	Apr. 19	Prices, Wholesale	Apr. 5	Vacuum Cleaners	Apr. 5
Gears	Apr. 12	Pumps	Mar. 15	Wages, Metalwk	Mar. 1
Gray Iron Castings	Mar. 15	Ranges, Elec.	Apr. 19	Washers	Apr. 12
Indus. Production	Mar. 29	Ranges, Gas	Mar. 22	Water Heaters	Mar. 22

aid for dealers during the winter months.

Retail Price Cuts . . .

At this point in the business cycle the consumer and wholesale price levels have shown little change. That many price cuts have been made, however, is evident from a perusal of Montgomery Ward & Co.'s midsummer sales book. The 252-page flyer, with its heavy assortment of items specially priced for the summer market, lists price cuts in almost every category.

Wholesale Prices Up . . .

At the wholesale level, prices showed a slight gain between February and March, according to the Bureau of Labor Statistics. Primary prices rose 0.1 per cent to 110.6 per cent of the 1947-1949 average. A fractional decline in the average prices of all commodities other than farm products and processed foods was more than offset by higher prices for farm products and processed foods. And the higher prices received for industrial materials during recent weeks probably will cause primary prices to rise again during April.

Production Still Skidding . . .

As the business decline continued during March industrial production suffered a slight further drop. Reduced manufacture of durable goods caused the Federal Reserve's seasonally adjusted index to dip to 123 per cent of the 1947-1949 average, 1 percentage point under February and 14 percentage points under the record high attained last July.

During the week ended Apr. 17, STEEL's industrial production index continued its slide of the past three weeks on the basis of preliminary figures. STEEL's index slipped to 202 per cent of the 1936-1939 average, 1 point below the preceding week.

Automobile Outturn Revised . . .

That automobile production during the first half of this year will be the third best in history has been confirmed by General Motors' upward revision of second quarter

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,604	1,622	2,228
Electric Power Distributed (million kwhr)	8,345	8,396	8,112
Bitum. Coal Output (daily av.—1000 tons)	1,108	977	1,414
Petroleum Production (daily av.—1000 bbls)	6,550[1]	6,568	6,281
Construction Volume (ENR—millions)	$306.6	$314.3	$195.1
Automobile, Truck Output (Ward's—units)	149,389	152,074	162,171
TRADE			
Freight Car Loadings (unit—1000 cars)	612[1]	607	752
Business Failures (Dun & Bradstreet, no.)	198	246	165
Currency in Circulation (millions)[3]	$29,793	$29,795	$29,753
Dept. Store Sales (changes from year ago)[4]	+16%	13%	13%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,302	$18,722	$17,667
Federal Gross Debt (billions)	$269.9	$270.0	$264.4
Bond Volume, NYSE (millions)	$14.9	$17.2	$14.8
Stocks Sales, NYSE (thousands of shares)	8,345	10,330	7,093
Loans and Investments (billions)[4]	$79.1	$78.1	$76.9
U. S. Gov't Obligations Held (billions)[4]	$31.5	$30.9	$29.7
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	214.2	211.9	226.0
All Commodities[7]	111.0	110.9	109.4
Commodities Other Than Farm & Foods[7]	114.5	114.5	113.2

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1954, 2,384,540; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939 = 100. [6]1936-1939 = 100. [7]Bureau of Labor Statistics Index, 1947-1949 = 100.

output goals. The GM revision calls for a 5-per-cent boost in its operations and lifts the industry's January-June forecast to 2,966,000 car completions, according to *Ward's Automotive Reports*.

Facts About Competition . . .

The terrific competition in the automobile industry is keeping the independents in a tight spot. Like the rest of the independents Studebaker's first quarter shrank. Studebaker built 25 thousand cars or 1.76 per cent of the industry total in the first three months, compared with slightly more than 35 thousand, or 2.36 per cent, in the first quarter of 1953.

Truck-trailer manufacturers are also suffering from the business decline. During February factory shipments of all types of truck-trailers amounted to 4,224 units valued at $17.2 million, the Department of Commerce reports. In the comparable month a year ago shipments of 5,921 units carried a value of $23.8 million.

Work and Pay . . .

The present decline, of course, centers in manufacturing. Manufacturing employment, seasonally adjusted, in March totaled 15.9 million, 160,000 less than in February and 1.16 million less than March, 1953, the Federal Reserve Bank says. Nearly all of the slide during March was in durable goods industries.

The average weekly earnings of production workers in manufacturing industries has dropped also. The weekly pay of factory workers during March averaged $70.53, or 35 cents less than February and $1.40 below year-ago levels. But for the rise in hourly earnings over the year the slide in weekly pay would have been higher. Hourly earnings in March averaged $1.79, 4 cents above March, 1953.

Borrowing Increases . . .

An increase in commercial and industrial borrowing, such as occurred during March, often precedes a business upturn. Commercial and industrial loans at the weekly reporting member banks of the Federal Reserve System increased $137 million during the month. Like March, 1953, most industrial classifications participated in the increased borrowing. The gain of $133 million in loans to manufacturers of metals and metal products was the largest increase for the category since last March.

LI *Reamers give you more*

LI

The Reamer Specialists

LAVALLEE & IDE, INC.

CHICOPEE, MASS.

How to Pick the Right Cutting Oil

WORD OF MOUTH?
It gives you the answer sometimes, but not many of your friends have the same cutting oil requirements and the same problems that you have. It's much surer to depend on specialists like Sun.

LABORATORY ANALYSIS?
Sure. But there's no formula for correlating the laboratory analysis with how well the cutting oil will work on your job. It takes years of field experience like Sun's to help you make the right choice.

ELABORATE SHOP TEST?
This will probably give you the answer. But it's expensive and interferes with production when you try to test all the oils available. Sun's experience can help keep your shop testing to a minimum.

EXPERIENCE IS THE ANSWER.
And Sun has it. Its field representatives have probably come across problems similar to yours many times. If they haven't, its cutting oil specialists and metallurgical technicians are ready to help with your problem.

Soluble or straight, transparent or black, light or heavy duty — Sun makes the kind of cutting oil you need to handle your job at the lowest cost. For more information, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-4.

INDUSTRIAL PRODUCTS DEPARTMENT

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SUNOCO

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Refiners of famous High-Test Blue Sunoco Gasoline

T. J. AULT
. . . heads Detroit Gear Division

DUNCAN S. GREGG
. . . Kaiser Aluminum purchasing mgr.

J. T. AuWERTER JR.
Acmor Conveyor Chain president

T. J. Ault becomes president and general manager of Borg-Warner Corp.'s **Detroit Gear Division**, Detroit. He succeeds **A. P. Emmert**, long-time executive of Borg-Warner who in July, 1953, interrupted his retirement and temporarily accepted the general managership of the division. Mr. Ault previously served as vice president and assistant general manager, a position he assumed in August, 1953. Prior to that he was vice president-purchasing agent for Warner Gear Division.

G. P. Messenger was made superintendent of the iron and steel foundries of **National Roll & Foundry Co.**, Avonmore, Pa. He previously was associated with Kensington Steel Co. where he served as chief metallurgist and research and development engineer, and more recently was with Detroit Arsenal.

Frederick J. Mayo was elected executive vice president of **F. H. McGraw & Co.**, Hartford, Conn.

Gear Grinding Machine Co., Detroit, appointed **William F. Wilson** works manager. He will direct all manufacturing operations in the firm's joint division, gear division and machine tool division. He formerly was with Walker-Turner Division, Kearney & Trecker Corp., where he served as works manager.

Duncan S. Gregg was appointed manager of purchasing and **Angus V. McLeod** manager of traffic for **Kaiser Aluminum & Chemical Corp.**, Oakland, Calif.

William J. Welch was elected a vice president of **National Lead Co.**, New York, and a member of its executive committee. Mr. Welch is a director of the company and manager of its metal department.

David Mayers, works manager of **Kaiser Aluminum & Chemical Corp.'s** sheet plate rolling mill at Trentwood, Wash., was made manager of the company's foil and sheet expansion plans. He is succeeded by **Marvin L. Lee**, former works manager of the extrusion plant at Halethorpe, Md. For the present Mr. Mayers will have headquarters with the project engineering group at Trentwood.

Sidney Andrews was named vice president in charge of research and development for **Metal Removal Co.**, Chicago. He will work on the firm's abrasive grinding wheels, discs and mounted points. Mr. Andrews formerly was engaged in production and research with Bay State Abrasive Products Co.

Donald A. Sommer was promoted to assistant sales manager, industrial division, **Keystone Steel & Wire Co.**, Peoria, Ill.

J. T. AuWerter Jr., who recently joined **Acmor Conveyor Chain Co.**, Cleveland, was elected president of the company.

Albert James was appointed general sales manager of **Ferro Powdered Metals Inc.**, Salem, Ind., subsidiary of Ferro Corp. **E. Raymond Engstrand** was made chief metallurgist and **John W. Polonetz** chief development engineer. **Joseph W. Farmer** was named chief engineer and **Lester Speichoff** master mechanic.

Irving T. Bennett was elected chairman of the board of **General Cable Corp.**, New York. He has been chief executive officer since August, 1953, and continues in that position. As chairman he succeeds **D. R. G. Palmer**, retiring after 35 years with General Cable and predecessor companies.

Graver Tank & Mfg. Co. Inc., East Chicago, Ind., elected as vice president, eastern sales, **C. W. Springer**, formerly eastern sales manager. **J. E. Fogarty** was named vice president and general manager of the mid-continent division, directing operation of the new Graver Supply Co., and **W. T. Hudson** was named vice president and manager of the Rocky Mountain and West Coast divisions. In addition, Mr. Hudson will direct operations at the new Graver plant for fabrica-

tion of field-erected tankage at Fontana, Calif. Named assistants to the president are **J. W. Kiser Jr.**, located in New York, and **J. W. Gosselin** in East Chicago. **H. J. D'Aragon** replaces Mr. Springer as manager of the eastern sales and **L. J. Cogan** was made assistant sales manager.

Emil Gairing, founder and former president of Gairing Tool Co., Detroit, joined **Waukesha Tool Co.**, Waukesha, Wis., as executive vice president and director. He will be responsible for sales, engineering and promotion.

Claude Smith was promoted from assistant manager to manager of the Dayton, O., regional office of the aeronautical division, **Minneapolis-Honeywell Regulator Co.** He succeeds **Ray Condon**, recently named to the newly created post of manager of military sales for the division.

Frederick W. McIntyre Sr. was named chairman of the board of **Reed-Prentice Corp.**, Worcester, Mass. He is succeeded as president by **Frederick W. McIntyre Jr.** **Iver G. Freeman**, for 30 years with Norton Co., has become a vice president of R-P to succeed Mr. McIntyre Jr. **Donald H. Dalbeck**, comptroller-treasurer, was also named a vice president.

Norton Co., Worcester, Mass., named **Hugh T. Price Jr.** factory manager of the grinding machine division, **Roland T. Nelson** as production manager and **Oscar A. Erickson** planning engineer.

William W. Deal was named manager of the Chicago district sales office of **American Steel & Wire Division**, U. S. Steel Corp. He replaces **Fred L. Nonnenmacher** who assumes Mr. Deal's former position of New York district sales manager.

Claud S. Gordon Co., Chicago, appointed **Ralph E. Johnston** superintendent of its Chicago plant.

Townsend Co. appointed **E. H. Stau** western division sales manager in Los Angeles and made **William L. Nicolay** assistant western division sales manager. Mr. Stau continues to serve as manager of aircraft sales for the company.

ELMER J. WEIS

ERWIN A. LOTH

new officers of Pacific Pumps Inc.

Pacific Pumps Inc., Huntington Park, Calif., elected **Elmer J. Weis** executive vice president and **Erwin A. Loth** vice president in charge of manufacturing. Mr. Weis formerly was vice president and director of sales and Mr. Loth has served as works manager.

Paul K. Rogers Jr., vice president, was elected president of **Skinner Chuck Co.** and Skinner Valve Division, New Britain, Conn. He succeeds **Arthur E. Thornton**, now chairman of the board. Mr. Rogers was re-elected treasurer and also a director. **Sherrod E. Skinner** fills the vacancy on the board left by his father, the late **E. J. Skinner**, former chairman. **Robert D. Twohig** was appointed assistant secretary and controller.

Robert A. Rohn, assistant manager of the Cleveland district sales office of **Aluminum Co. of America**, transferred to San Francisco district sales office to assume the newly created position of assistant manager of that office.

Following the recent death of **Knowlton D. Montgomery**, president and chairman of **Hunter Spring Co.**, Lansdale, Pa., the following officers have been elected: **W. J. Cook** is president, **P. C. Clarke** executive vice president, **S. K. Freed** treasurer, **H. O. Hess** secretary and **F. E. Cassel** assistant secretary. Mr. Cook was formerly vice president-general manager and for a number of years has led the producing operations of the company.

J. A. Crooks, in addition to duties as manager of commercial research for **Bethlehem Pacific Coast Steel Corp.**, San Francisco, was given a new position as assistant to S. S. Cort, vice president-sales.

Standard Pressed Steel Co., Jenkintown, Pa., promoted **Joseph P. Villo** and **Frederick D. Fernsler**. The former was made division manager of aircraft and allied products and Mr. Fernsler becomes manager of the Unbrako-Flexloc Division.

Roy E. Smith, formerly president and general manager of Stefco Steel Co., Michigan City, Ind., was named manager of **Stran-Steel Products Co.**, new Chicago area sales agency for the industrial and commercial steel buildings of Great Lakes Steel Corp.

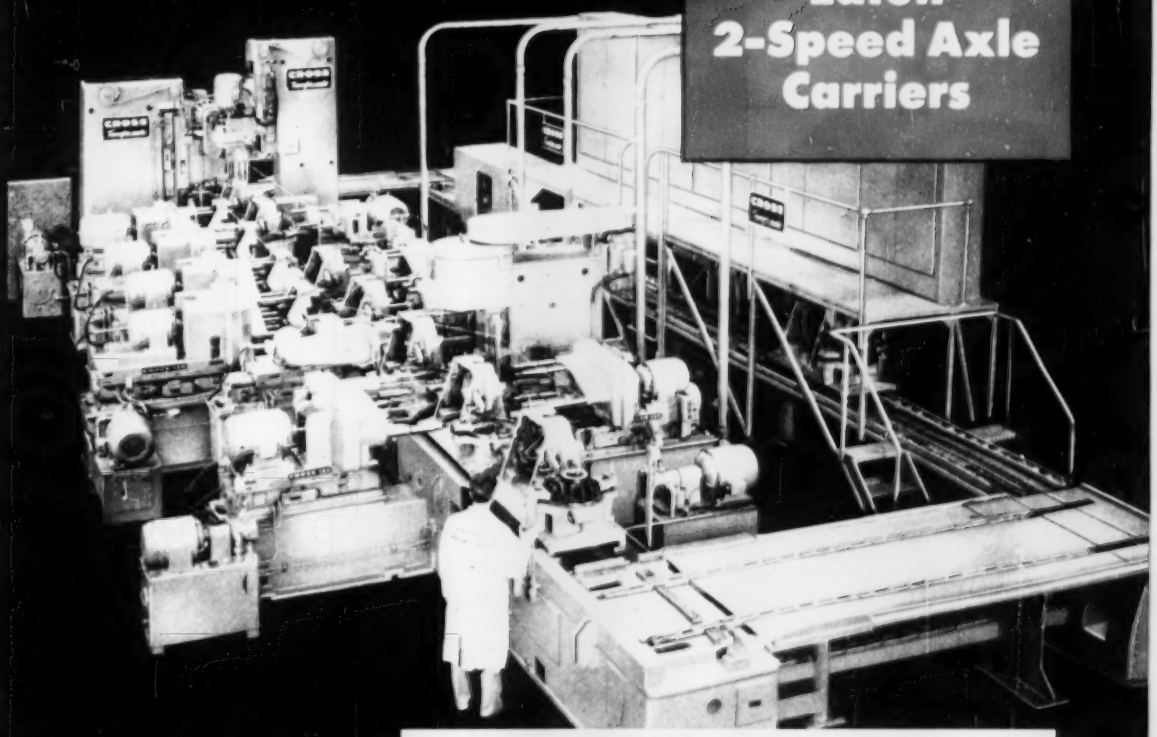
Harold F. Beale was made assistant to the president of **Standard Coil Products Co. Inc.**, Los Angeles.

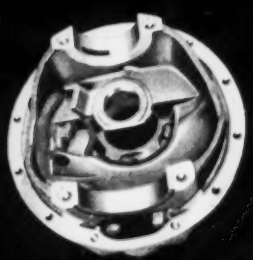
Peter Langan was made plant superintendent of **Foster Wheeler Corp.**, Wilkes-Barre, Pa. He formerly was head of General Electric Co.'s hardware manufacturing division and also served Rheems Mfg. Co. as superintendent of its plant in Burlington, N. J.

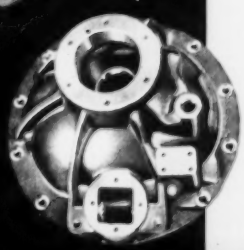
Charles D. Scribner was made vice president of industrial relations for **Packard Motor Car Co.**, Detroit. He formerly was with the

Another Transfer-matic by Cross

Mills, Drills and Taps Eaton 2-Speed Axle Carriers







- ★ 53 parts per hour at 100% efficiency—capacity for spiral bevel or hypoid style carriers.
- ★ 97 operations: 60 drilling, chamfering and reaming; 5 milling; 4 spotfacing and counterboring; 28 tapping.
- ★ 9 stations: 1 loading, 1 unloading, 7 machining.
- ★ Two-position, progressive type work holding fixtures with automatic transfer from station to station and integral conveyor for automatic return from unloading to loading station.
- ★ Cleaning unit for removing chips from fixtures between unloading and loading station.
- ★ Other features: Complete interchangeability of all standard and special parts for easy maintenance; construction to J.I.C. standards; hardened and ground ways; hydraulic feed and rapid traverse; individual lead screw feed for tapping; coolant system; automatic lubrication.

Established 1898

THE **CROSS** CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

J. W. McMULLEN
an Allis-Chalmers v.p.

HERMAN A. GLEDHILL
manages new Heppenstall plant

W. J. THOMAS
. . . a v.p. of Babcock & Wilcox

central industrial relations office of General Motors Corp.

J. W. McMullen, general manager of the Pittsburgh Works of **Allis-Chalmers Mfg. Co.**, was named vice president in charge of transformer and switchgear equipment in the firm's general machinery division. With headquarters at the West Allis, Wis., Works, he will be responsible for operations at the Pittsburgh Works and Boston Works and for all transformer and switchgear operations at the Hawley, West Allis and Terre Haute, Ind., plants.

Cincinnati Lathe & Tool Co., Cincinati, promoted **John D. Humphreys** to assistant chief engineer.

Phelps Wilder was elected vice president and director of sales for **Chicago Rawhide Mfg. Co.**, Chicago.

Herman A. Gledhill, general superintendent of the Bridgeport, Conn., plant of **Heppenstall Co.**, was appointed general manager of the former Chapman-Price steel plant recently acquired by Heppenstall at Indianapolis.

New director of purchasing and inventory control for the **Promat Division** of Poor & Co., Waukegan, Ill., is **George J. Olbur.**

Walter A. Fink retired as an officer and director of **Toledo Scale Co.**, Toledo, O. He had served as executive vice president since 1946.

Joseph A. Palko is sales representative in the Youngstown marketing area for **Follansbee Metals**, a division of Follansbee Steel Corp.

Jervis B. Webb Co., Detroit, elected **E. W. McCaul** vice president in charge of sales.

W. J. Thomas, general manager of **Babcock & Wilcox Co.'s** tubular products division, Beaver Falls, Pa., was named a vice president of the company.

Arthur Kuiper, treasurer of **Continental Foundry & Machine Co.**, East Chicago, Ind., was elected a director to succeed **William B. Todd**, former executive vice president who retired last year.

Robert Shoenhair was named assistant manager of the Washington office of **AiResearch Mfg. Co.**, a division of Garrett Corp.

J. D. Kelsey, R. Adm., U. S. Navy (ret.), was appointed administrative assistant to the president of **Standard Railway Equipment Mfg. Co.**, Chicago.

Philip Glick was made corporate secretary of **Eastern Brass & Copper Co.**, New York.

OBITUARIES . . .

Paul F. Mumma, 54, general superintendent of U. S. Steel Corp.'s **National Tube** plant at Gary, Ind., died Apr. 16.

Howard R. Heinze, 37, vice president and secretary, **M. P. Heinze Machine Co.**, Chicago, died Apr. 7.

Wiggo A. Willadsen, 55, supervisor for **Pacific Coast Iron Pipe & Fitting Co.**, Los Angeles, died Apr. 1.

Charles H. Mitchell, former works manager and vice president, **Canadian Westinghouse Co.**, died Apr. 10 in Hamilton, Ont.

John D. Keenan, 63, president, **American Steel Chase Co.**, Long Island City, L. I., died Apr. 11.

Ernest A. Herrcke, 65, sales engineer and district manager of **National Automatic Tool Co.**, Chicago, died Apr. 10.

Frazer Matthews, 70, president-general manager, **Ontario Bridge Co.** and vice president of Disher Steel Construction Co. Ltd., died Apr. 11 in Toronto, Ont.

Charles W. Staacke, 56, authority on conveyor belt design, construction and installation, died Apr. 9. He was technical adviser on conveyor and belting sales for **Hewitt-Robins Inc.**, Stamford, Conn.

J. Harvey Byers, 73, president, **Abrasive Products Co.**, Lansdowne, Pa., and vice president of Exolon Co., Tonawanda, N. Y., died Apr. 12.

Don't wait...Investigate the

Kearney & Trecker

TOOL-LEASE

PROGRAM

Here's a common sense approach to your plant modernization program

It's the most significant opportunity ever offered users of milling machines and precision boring machines

In these times, modernization is the soundest approach to meeting increasingly competitive conditions. And the best way to modernize — to improve products, cut costs, gain productive flexibility — is to retool with new machines. Today, Kearney & Trecker's new Tool-Lease Program offers you an unmatched opportunity to "junk the clunkers" that are nibbling away at your profits. It's time to act. Don't wait — investigate!

These are only a few of the advantages Tool-Lease offers you

You can try out new machines in your own plant . . . without being obligated to purchase them. You can get hitherto impossible flexibility and capacity to take advantage of changing production requirements without risk of obsolescence. Last, but not least, you can expand production without tying up working capital, going into debt, or impairing future borrowing capacity.

Tool-Lease helps you get the exact milling or boring machines you need

Under Tool-Lease, you can rent any Kearney & Trecker standard knee or bed type milling machine or precision boring machines. If you require special machinery or heavy-duty CSM bed-types, special agreements will be considered.

Three basic plans give you varying options to continue or terminate the lease or purchase the equipment.

For complete details on Tool-Lease . . . help in analyzing your milling and precision boring needs — see your Kearney & Trecker representative or mail coupon to Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.

THE CRITICAL PICTURE OF CREEPING OBSOLESCENCE . . . AND HOW TO STOP IT!

Let's take a typical basic industry as an example — Agricultural equipment. Of the 5235 standard knee type horizontal, vertical, bed and manufacturing milling machines and precision boring machines in use today — *which could be replaced by Tool Lease equipment* — 26% are 10-20 years old, 19.9% are more than 20 years old.

TOOL LEASE
KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS
EQUIPMENT

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Please send me Bulletin TL-10A with details on the Tool-Lease Program. ☐ Check here if you would like to have a representative call on you as soon as possible. (or call Milwaukee, GLenfield 6-8200)

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Title

Company

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City Zone State

We're quick on the draw, too!

(especially on cold finished bars)

Do you need cold finished bars drawn quickly—and accurately—to your individual specifications? Then it'll pay you to check with Columbia before you order. If *c're geared for service.*

Our research, production and sales groups are small enough to give you the kind of personal service that follows a job through from start to finish . . . and big enough to get volume production rolling in a hurry on your special bar problems.

Our modern plant is flexible, versatile and completely equipped to produce a broad range of cold finished carbon and alloy bars in the specific sizes and shapes you need. It's laboratory controlled through every step of production to guarantee top quality products.

Why not bring your cold finished bar problems to Columbia today? We'll welcome the opportunity to provide you with samples, technical literature and assistance—or to work with you right in your own plant. Address: Columbia Steel & Shafting Company, Pittsburgh 30, Pa.

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MANUFACTURERS OF COLD FINISHED STEEL BARS AND SEAMLESS STEEL TUBING

District Offices: BUFFALO • CHATTANOOGA • CHICAGO • CLEVELAND • DAYTON • HARTFORD • MILWAUKEE • PHILADELPHIA • PITTSBURGH

Inland Maps Expansion

$35 million will be spent in 1954 for new plant facilities and ore mine development

INLAND STEEL CO., Chicago, plans 1954 capital expenditures of $35 million, an increase of $11 million over 1953 investments in new facilities. Heaviest outlays are scheduled for development of the company's Caland ore properties in Ontario, Canada.

The Canadian ore mine is not scheduled to come into production until 1960. It is estimated to contain at least 50 million tons of high-grade iron ore, and is considered "protection on this prime raw material far into the future," company officials say.

Plant Facilities—The year's plans also include an addition to power generating capacity at the Indiana Harbor, Ind., steel plant and construction of six new soaking pits. Completion of these facilities will provide for future plant growth and permit better use of all facilities.

Inland Steel also is building a second continuous galvanizing line and making improvements in its cold-rolled sheet and tin plate departments.

Wisconsin Foundry Opens

Waunakee Alloy Casting Corp. opened its new foundry in Waunakee, Wis. The firm was organized by J. Trantin Jr. who also is president of Youngstown Alloy Casting Corp., Youngstown. Both of these companies produce special alloy steel castings.

Wausau Enlarges Facilities

Wausau Mfg. Co., subsidiary of Borg-Warner Corp., Chicago, is renting the plant and some of the manufacturing equipment of Marathon Foundry & Machine Co., Wausau, Wis. The plant is being renovated for the production of 105-mm turret assemblies adaptable to a new-type amphibious tank. The tank is being manufactured for the Marine Corps by Ingersoll Products Division of Borg-Warner in Kalamazoo, Mich. Officers of Wausau Mfg. include J. H. Ingersoll, president; Fred W. Cederleaf, vice president and plant manager; Robert F. Schutz, vice president; and H. A. Schmeal, secretary and treasurer.

Detroit Firm Buys Daybrook

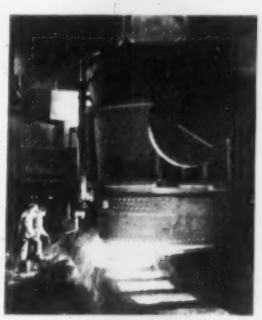
L. A. Young Spring & Wire Corp., Detroit, purchased Daybrook Hydraulic Corp., Bowling Green and Upper Sandusky, O. Daybrook produces steel dump bodies and hydraulic products, including power tail gates, farm hoists, pumps, and hydraulic hoists. Operations will be continued as the Daybrook Hydraulic Division.

Bloomfield Tool To Build

Bloomfield Tool Corp. will build a plant in Roseland, N. J. Upon completion on about Oct. 1, the company will vacate its present Bloomfield, N. J., facilities and move all of its activities to the new location. The firm specializes in large precision, close-tolerance, intricate machine work and engages in custom-built machinery and parts to specifications. The corporation will change its name to Kidde Precision Tool Corp. as of May 1; it is a wholly owned subsidiary of Walter Kidde & Co. Inc., Belleville, N. J.

Cold Metal Products Expands

Cold Metal Products Co., Youngstown, opened its cold-rolling plant at Indianapolis. A. C. Prudner is manager of this plant which is equipped for the production of specialty items of carbon and alloy cold-rolled strip steel. This marks another step in the firm's long-range expansion program. Its subsidiary, Kenilworth Steel Co., Kenilworth, N. J., increased capacity of its plant during the past year. Later this year, a new plant at Los Angeles will be built to



Henry J. Kaiser Co. Observes 40th Anniversary of Founding

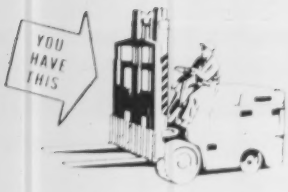
Huge industrial organization operates 116 plants and makes more than 290 products, ranging from basic steel and aluminum to automobiles and homes

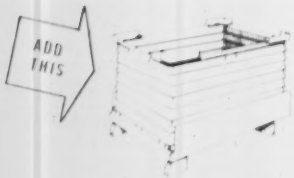
HENRY J. KAISER CO., Oakland, Calif., is celebrating the 40th anniversary of its founding this year. It has mushroomed from a lowly beginning in 1914 as Henry J. Kaiser Co. Ltd. in Vancouver, B. C., to one of the 30 largest organizations in the United States in terms of sales. It is one of the country's most diverse organizations.

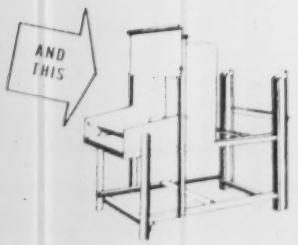
Kaiser enterprises contribute more than 290 products and services to the nation's economy, covering such fields as steel, mining, refractories, aluminum, aircraft, automobiles, building materials, chemicals, cement, electronics, engineering, gypsum, heavy construction, housing, household products, hospitals, and shipping.

Consolidated statistics of the Kaiser-managed industries are impressive and show the following: Annual purchases of more than $543 million in supplies and services; expenditures of $90 million for expansion during 1953; 116 plants and facilities located in 15 states and territories and 13 foreign countries; total assets of $925 million; annual sales of more than $1 billion.

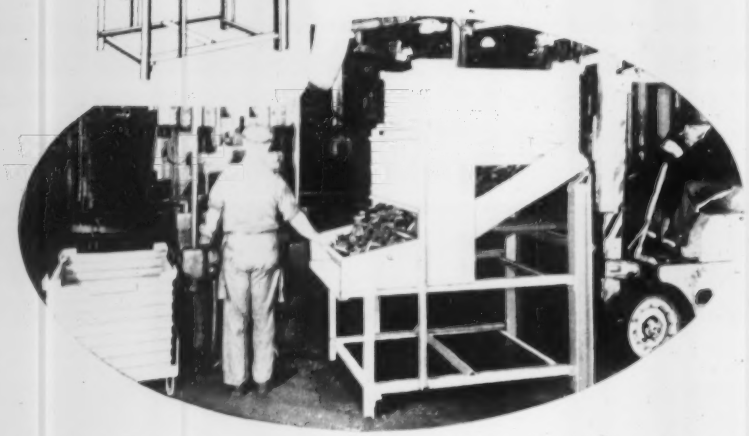
Kaiser's anniversary report reveals "as of Nov. 30, 1953, the total funds employed in the business of various Kaiser companies amounted to approximately $820 million. Of this figure approximately 97 per cent was private capital and less than 3 per cent was in the form of loans from the government."







Put these 3 together ...see what you SAVE!



Notice how these 3 units team up to increase production. The drop-bottom feature of the Work-O-Matic box is also a great time saver in many other dumping operations.

RIGHT now, in plant after plant, this Work-O-Matic* combination is boosting production up to 52.8% per work station . . . *without an increase in machines, man power or space.* Here are the reasons—

First, the Work-O-Matic drop-bottom box discharges *automatically* when placed in the positioning stand, providing a mass supply of material at proper work level! This cuts down the time and effort of both truck and process operators.

Secondly, the station is far more *productive*, because waste-motion stooping and stretching elements are eliminated as well as lost time waiting for material supply.

Write for Catalog 83 describing these and other Work-O-Matic units. Address The Union Metal Manufacturing Company, Canton 5, Ohio.

*Patent No. 2,445,038. Other patents pending.

UNION METAL
Material Handling Equipment

replace the smaller one occupied by Cold Metal Products Co. of California for the last seven years.

Caterpillar Enlarges Plant

Caterpillar Tractor Co., Peoria, Ill., is constructing a machine shop, precision shop and materials control office for its research department. The building will provide about 26,000 sq ft of floor space.

Ohrstrom Buys Inet Inc.

G. L. Ohrstrom Associates, New York, purchased Inet Inc., Los Angeles, manufacturer of electronic and magnetic equipment, for operation as Leach Relay Co.

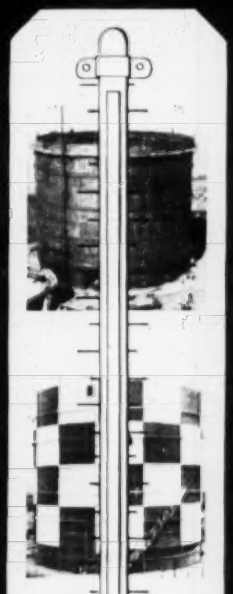
Building Container Plant

United States Steel Corp., Pittsburgh, is building a container plant in Pennsauken Township, just north of Camden, N. J. This is the third new plant to be started by the corporation in the Delaware valley in a little more than three years, the others being the Fairless Works and National Tube Division's facility. The container plant, to be operated by U. S. Steel Products Division, will be com-

Corrosion Proof

Problem of coating steel piles with Gunite to make them corrosion proof and driving them without disturbing the coating has been solved. Before Gunite was applied to H-piles, above, specially fabricated steel rods were tack-welded. Nubs on the rods provide means for attaching wire mesh

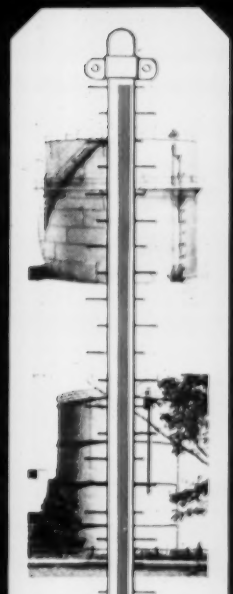
from the **ARCTIC** to the **TROPICS**



more than

130

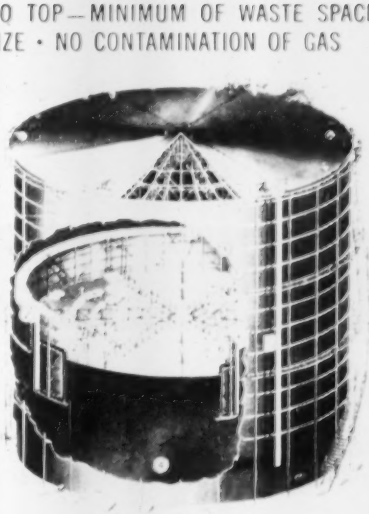
WIGGINS GASHOLDERS have eliminated operating costs for users of chemical process and industrial gases



This 100% dry seal gasholder (no water, tar, no grease) has proved itself under every condition of climate and temperature. Because of the seal and the simple operating mechanism operating costs have been entirely eliminated. Comparison maintenance expens by owners of Wiggi gasholders also show remarkable savings. Companies who hav converted old-type gasholders to the Wiggins advantages have been able to en joy similar savings. Write for information

PISTON RISES NEARLY TO TOP—MINIMUM OF WASTE SPACE
CAN BE BUILT ANY SIZE • NO CONTAMINATION OF GAS

1. Space above piston completely ventilated.
2. Wide clearances simplify operation.
3. Gas-tight frictionless seal not affected by weather.
4. Piston rests on bottom when empty—less than ½ of 1% dead space for purging.
5. Leveling device—independent of side wall—keeps piston level.
6. Fenders prevent all tension in seal.



Wiggins Gasholde

by GENERAL AMERICAN

WIGGINS VAPOR SEALS
GENERAL AMERICAN
TRADE MARK

General American Transportation Corporation
135 SOUTH LA SALLE STREET • CHICAGO 90, ILLINOIS

Offices in Principal Cities

Export Dept.: 380 Madison Avenue, New York 17, N. Y.

Plants: Birmingham Ala. • East Chicago, Ind. • Sharon, Pa.
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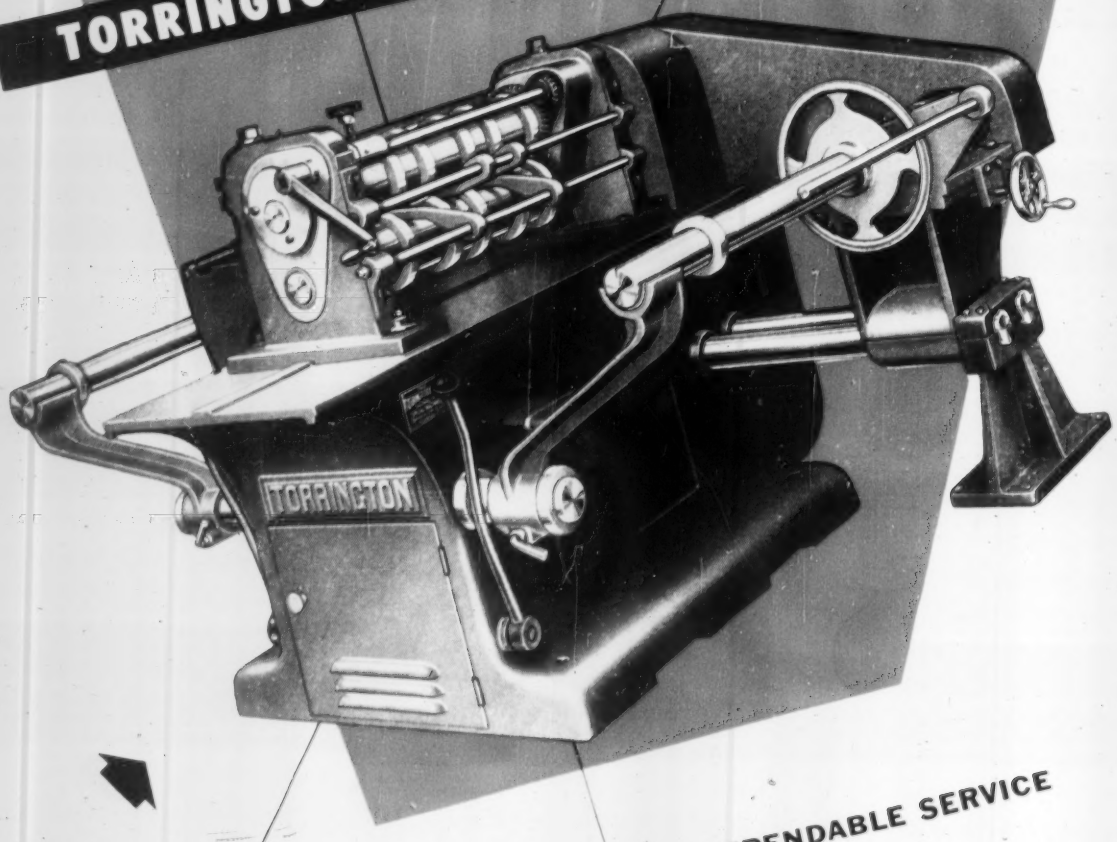
TORRINGTON SLITTING MACHINES...



FAMOUS FOR YEARS OF CONTINUOUS, DEPENDABLE SERVICE

These compact, easily operated machines are especially designed to meet the needs of sheet metal fabricators who require slitters that can be quickly set up to produce any desired combination of cuts on any gauge of metal within their range. The product of years of research, development and experience, Torrington Standard Slitters are famous for continuous, dependable service.

THE **TORRINGTON**
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER SIXTY-FIVE YEARS

pleted early next year and will have an annual capacity of about 2.4 million steel drums and 3.2 million pails. Containers will range in size from 3½ to 7-gallon pails up to 100-lb grease drums and 55-gallon oil drums. John Hauerwaas, president of the division, indicates that production of oil drums will account for the largest tonnage of any one product fabricated at the new plant.

Tops in Protection

STEEL PLATE installation on a bank vault, so strong that it probably would take a hydrogen bomb to breach it, is under way in New York.

More than 100,000 lb of precision-fitted steel plate lining is being installed in Manufacturers Trust Co.'s Fifth avenue office safe deposit vault.

The vault and its 16-in. thick, 30-ton door are being constructed and installed by Mosler Safe Co., New York. This door, the company says, is stronger, heavier and thicker than the two Mosler vault doors which successfully withstood the atom bomb explosion at Hiroshima.

The vault measures 60 ft long, 22 ft wide and 11 ft high and weighs more than 2 million lb. It has reinforced concrete walls 1½ ft thick upon which the steel plates are mounted.

Buys Galvanizing Business

Dominion Foundries & Steel Ltd., Hamilton, Ont., purchased all fixed assets connected with the galvanizing department of Lysaght's Canada Ltd. The galvanizing business will be operated by Dominion as a division.

Detroit Stamping Expands

Detroit Stamping Co., Detroit, completed an 11,000-sq-ft addition to its plant. The firm's precision valve stamping department has been doubled, while the tool and die department has taken over the former valve production area. The company does general stamping work of light to medium-heavy

Special Measuring Anvils adapt this standard Federal Dial Indicator Gage for checking narrow shoulders on small parts. It proves by its speed and accuracy that there's no gage so economical to use as a Federal Dial Indicator Gage, when *quantities* are too small for automatic gaging.

Inexpensive Gages Save Money, Too!

The trend toward automation has focused attention on the cost-cutting advantages of complicated, costly gages for inspecting, measuring, sorting and size-control. But such prominence has caused top management of many firms to question:

"If we can't afford complicated gages, isn't there an alternative? Must we continue to be handicapped by the slowness and human error inherent in out-moded micrometers and fixed gages?"

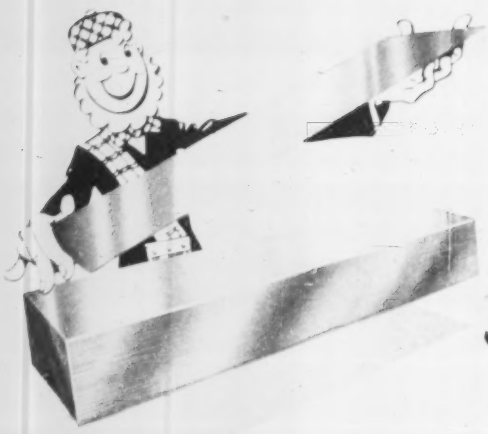
There is an alternative, as many firms now know. They're the ones who have investigated the *complete* line of *modern* Federal gages. They've found that it includes dial-indicating, air, electric and electronic types. They've seen some that cost as much as $100,000.00; others that run as little as $00.00. They've been impressed by low-cost Federal dial-indicating gages that cut inspection time in halves, because operators *see* dimensions and limits instead of *feeling* them. So, they've concluded that Federal, with its broad line, is best qualified to give an unbiased recommendation of the right-priced gage for *any* job.

It's easy to investigate Federal Gages. Catalog 52 and our price list tell the whole story. They'll show you, as well as your production and quality control engineers, gages that cut costs on long or short runs. They'll prove that gages need not be complicated or costly to save money for your firm. Write for your copies today. Federal Products Corporation, 1214 Eddy St., Providence, R. I.

Ask **FEDERAL**

FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Machine Size Control



"HOW MANY POUNDS IN A STAINLESS SHEET?"

When sheets are ordered by gauge number, permissible A.I.S.I. thickness variation is plus or minus 10%. Thus, if you order standard 18 gauge 36"x120" stainless sheets you may receive .052" thickness—while your job might actually require about .0475". And in the matter of weight, the theoretical weight of this same standard sheet is 63.00 pounds—but it may permissibly vary between 59.22 and 65.52 pounds. Remember, you purchase sheets *by weight*.

MicroRold Stainless may be ordered rolled to the "light side" of the gauge range. MicroRold Stainless may be held within a 3% tolerance—with such micro-accuracy that you are assured constant uniformity throughout your sheet or strip. And since each one-thousandth inch saved in thickness saves 1.26 pounds per sheet, MicroRold's amazing thinness control may well save you money.

Ask your steel warehouse distributor about MicroRold Stainless.

Washington Steel CORPORATION

WASHINGTON, PENNSYLVANIA

Ford Begins J-57 Output

First production-line J-57 turbojet engine from Ford Aircraft Engine Division, Chicago, is lowered into its shipping canister for movement to the Air Force more than two months ahead of schedule. Spectators are Maj. Gen. W. F. McKee, Air Materiel Command; Henry Ford II, president, Ford Motor Co.; A. C. Moore, general manager, Aircraft Engine Division

fabrication, blanking, drawing, coining, forming and similar work.

Will Build Ammonia Plant

Alabama By-Products Corp., Birmingham, and Hercules Powder Co., Wilmington, Del., are working out plans for a joint undertaking for a new manufacturing facility to be located in the Birmingham district. The plant is designed for initial annual production of 15,000 tons of anhydrous ammonia, a chemical widely used in industry and agriculture.

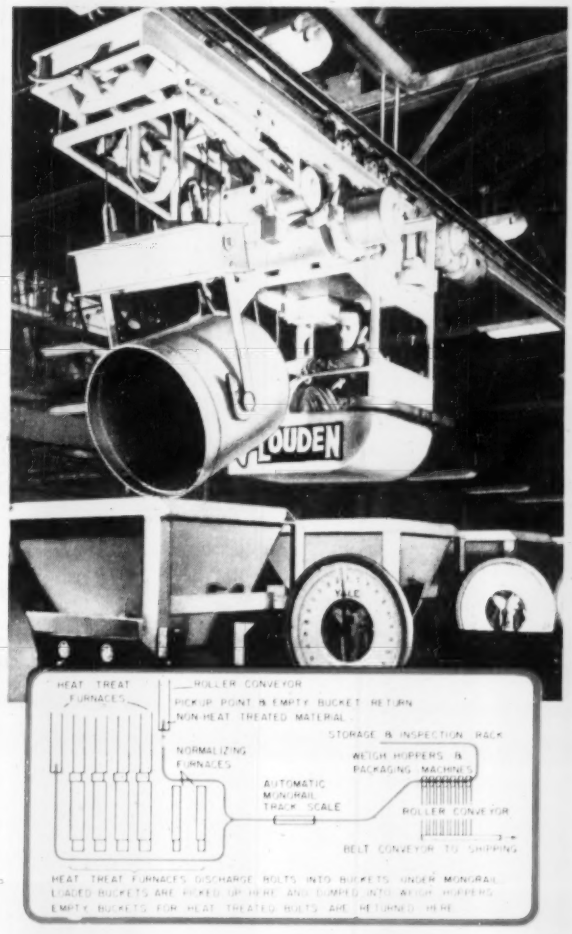
AMF Buys BMC Mfg. Corp.

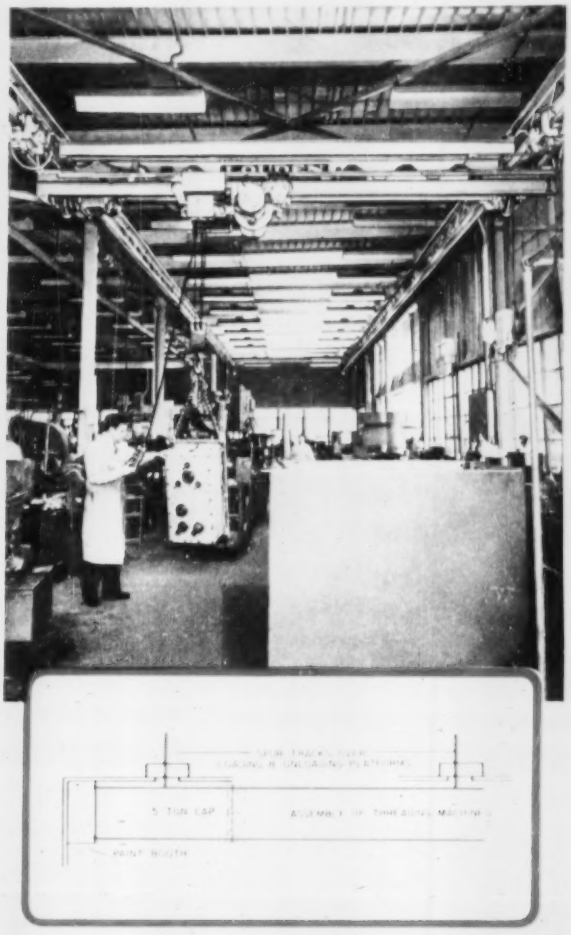
American Machine & Foundry Co., New York, purchased BMC Mfg. Corp., Binghamton, N. Y., manufacturer of juvenile wheel goods and pressure lock wrenches.

Forms Production Metals Inc.

Aubrey L. Moss organized Production Metals Inc., 129 Pierrepont St., Brooklyn, N. Y., as a warehouse distributor of aluminum sheet, rod, tubing, coils, wire circles, angles, extrusion and allied items. The firm also will maintain

Parts for packaging or components for assembly?


LOUDEN
HEAT TREAT FURNACES
ROLLER CONVEYOR
PICK-UP POINT & EMPTY BUCKET RETURN
NON-HEAT TREATED MATERIAL
STORAGE & INSPECTION RACK
NORMALIZING FURNACES
WEIGH HOPPERS & PACKAGING MACHINES
AUTOMATIC MONORAIL TRACK SCALE
ROLLER CONVEYOR
BELT CONVEYOR TO SHIPPING
HEAT TREAT FURNACES DISCHARGE BOLTS INTO BUCKETS UNDER MONORAIL. LOADED BUCKETS ARE PICKED UP HERE AND DUMPED INTO WEIGH HOPPERS. EMPTY BUCKETS FOR HEAT TREATED BOLTS ARE RETURNED HERE.



Louden engineered overhead handling speeds and saves in many ways

Many plant executives have found a broad avenue to savings and production increases in Louden engineered Monorail and Crane systems . . . products of the longest overhead handling experience.

Above, left, a Louden cab-controlled carrier conveys heat-treated parts from furnaces to packaging machine hoppers. With handling overhead, furnaces are grouped closer together. Rehandling is eliminated. Machine non-productive time is cut. Much the same is true of the installation shown at the right where a Louden 5-ton crane is handling a component for final assembly in a screw thread machine factory.

Let Louden's long experience and complete line of equipment bring you the best solution to your handling problems.

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SEND FOR THIS BOOK— Write for your copy of "Economical Material Handling" . . . full of time-saving, cost-cutting ideas and case histories. Free . . . no obligation.

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MONORAIL & CRANES

Since 1867—the first name in materials handling

an ACCO product

PAGE
Manufacturers' Wire

ROUND

FLAT

OR

SHAPED

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON

PAGE makes them all

YOU draw the Shape...
PAGE will draw the Wire

Cross-sectional areas up to .250" square; widths up to ¾"; width-to-thickness ratio not to exceed 6 to 1.

Tell us the way you want it. We'll follow your specifications.

Write or wire today

ACCO

Page Steel and Wire Division
AMERICAN CHAIN & CABLE

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

plus Welding Electrodes Wires Rods

separate departments for brass, copper and stainless steel.

REPRESENTATIVES

Stocks of oil field tubular goods, manufactured by **Rheinische Tube Mills**, Dusseldorf, Germany, will be warehoused in Houston and distributed by the newly-formed Rhinetubes Inc., 205 E. 42nd St., New York. Robert Horlander is division manager; G. N. Larson, sales manager, in Houston. Officers of the new company are Herman Polenz, president; Charles Shiro, executive vice president; Robert Nyssen, vice president; Kurt Orban, secretary and treasurer.

Republic Steel Corp., Cleveland, appointed Republic Supply Co. of California, an independent concern with offices in Los Angeles, as a West Coast distributor for its oil country tubular goods and line pipe. Harvey A. Craig is Pacific Coast manager for Republic Steel.

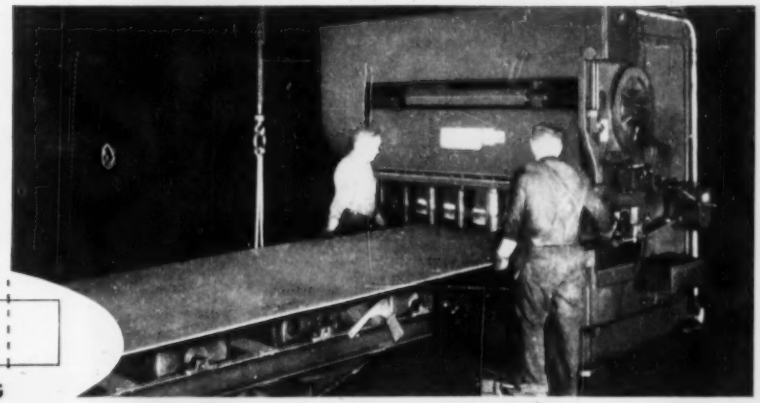
Reynolds Metals Co., Louisville, appointed as distributor of its aluminum mill products Industrial

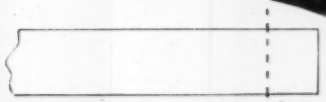
Wide World

Brawny Ore Conveyor

This conveyor system at Pennsylvania Railroad's $10-million Delaware river pier in Philadelphia will carry 3600 tons of iron ore an hour more than one-quarter mile. Being tested here, it has high-tensile steel cables embedded in rubber to withstand strain of transporting thousands of tons of ore

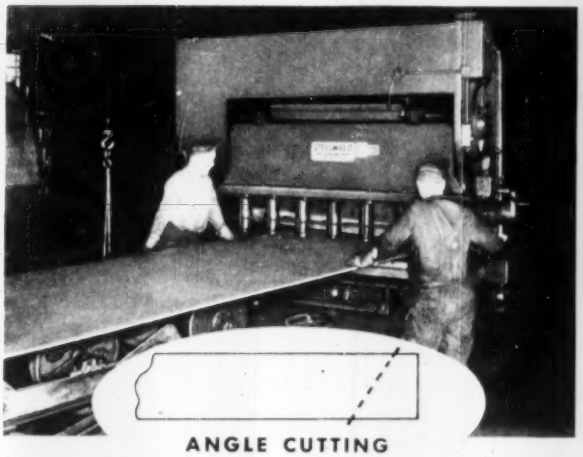
Steelweld Shears operate on the widely acclaimed pivoted blade principle. Shear action is controlled by electric foot switch. Machines for making cuts up to 21'0" are now in service.





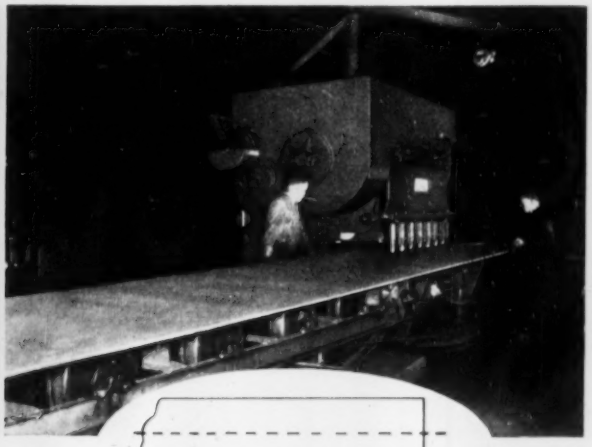
SQUARE CUTTING

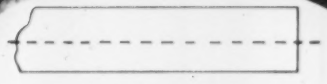
Here's a **VERSATILE SHEAR** that *Speeds Production*



ANGLE CUTTING

Because of the deep throat in end housings, larger size sheets or plate can be cut at various angles than possible with most shears. This is also a great advantage when notching and slitting.





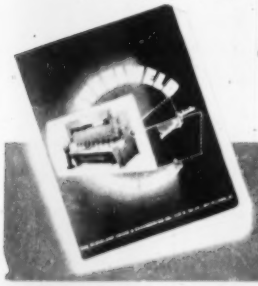
SLITTING

The standard 24" throat depth permits slitting sheets up to 48" wide on any line. 36" throats are also available for larger machines.

SQUARE or angle cut, slit or notch — any can be made quickly on a Steelweld Shear.

Not only will Steelwelds handle every kind of cut, but they are provided with unusual features that make their operation easier and faster and assure accuracy.

Send for the catalog below. Learn why Steelweld Shears are the most outstanding on the market today.



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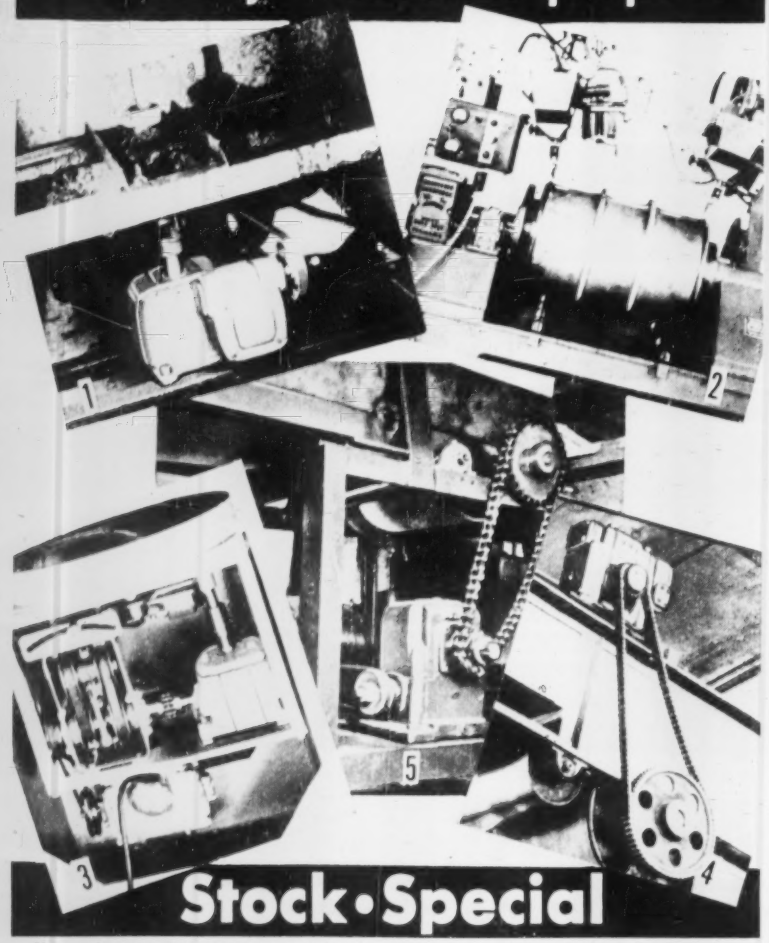
7837 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE **SHEARS**

OHIO

SPEED REDUCERS

for every industrial purpose

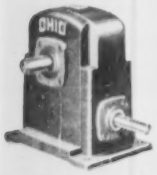


Stock • Special

Years of engineering experience, combined with the most modern equipment and quality materials go into the manufacture of Ohio Gear speed reducers.
Every detail of production and workmanship is designed to insure accuracy, durability and years of trouble-free operation.
Illustrated above are a few applications by large manufacturers who depend on Ohio Gear.

1. Ohio Gear DPL Speed Reducer operating a paint booth turn-table in a large metal working plant.
2. Ohio DS Speed Reducer, 300 to 1 ratio, used in the drive of a machine which automatically welds both heads into the shell of a 55 gallon barrel.
3. A PL2 Reducer, 40 to 1 ratio, operating the turn-table of a machine automatically welding automobile crankshaft vibration dampers.
4. Ohio Gear DHU Speed Reducer operating an overhead scrap conveyor belt in a large die casting plant.
5. Series of Ohio Gear HS Speed Reducers operating conveyors in a California fruit packing plant.

Consult your nearest distributor or write us for complete information.



ESTABLISHED 1915

OHIO GEARS

THE OHIO GEAR COMPANY, 1359 East 179th St., Cleveland 10, Ohio

Metals Inc., Kansas City, Mo. Reynolds appointed McDermott Metals Co., Philadelphia, as a distributor of its architectural aluminum and a limited range of plain flat sheet products, as well as sheet in some of the various embossed patterns.

Elastic Stop Nut Corp. of America, Union, N. J., appointed Clary Multiplier Corp.'s Aircraft Hardware Division, Los Angeles, as a jobber for its complete line of self-locking nuts.

J. C. Corrigan Co. Inc., Boston, appointed as distributor of its conveyor systems the Griesing Engineering Co., New Haven, Conn.; Conveyor Specialty Co., Syracuse, N. Y.; Joseph F. McGinn, Philadelphia.

NEW ADDRESSES

New England Light Alloy Co., Hingham, Mass., acquired larger manufacturing facilities at the plant formerly occupied by Lowell Brass Founders, Lowell, Mass., and will move there about May 15. The company makes chain saws and small tools.

Precision Apparatus Co. Inc., manufacturer of radio, television and electronic test equipment, will move from Elmhurst, N. Y., to its new plant in Glendale, N. Y., by midsummer. The plant will be occupied also by its wholly owned meter manufacturing subsidiary, **Pace Electrical Instruments Co. Inc.**

Mount Vernon Implement Co., maker of seeders, drills, spreaders and other farming tools, moved to Norwalk, Conn., releasing space at the Stamford, Conn., plant for its parent company, Consolidated Diesel Electric Corp.

Scovill Manufacturing Co., Waterbury, Conn., moved its Rochester, N. Y., sales and service offices to 175 Dodge St. The office handles Scovill's brass and aluminum mill products, closures and other metal products.

Kasson Die & Motor Corp. moved to 32-14 Northern Blvd., Long Island City 1, N. Y. The

OVER A MILLION TONS OF STEEL HANDLED ANNUALLY AT U.S. STEEL'S DUQUESNE WORKS

—by ROSS *Carriers*

Running the roads and arteries of U. S. Steel's huge Duquesne Works is a team of seven Ross Carriers and two Ross lift trucks—fast, mobile, well suited to handling over a million tons of steel according to precision-engineered plan.

Quickly dispatchable by radio to any point, the Ross Carriers haul their loads of blooms and billets, and handle semi-finished steel between conditioning yards, stockfield areas and finishing mills. The Ross lift trucks work effectively with the Carriers—moving and piling smaller loads, and removing them as needed for rolling orders.

Formerly, steel had to be handled up to seven times by locomotive and crane from primary to secondary mills. Now, steel is at the finishing mills, usually after only two rides on a Ross—never more than four. The carriers also move ingots, scrap in charging boxes, and maintenance spares. In addition, storage space inaccessible by crane is now put to good use.

Are not these time-saving, money-saving advantages, built into Ross Carriers, waiting discovery in your business? Why not call in the Ross dealer to help find your own substantial benefits. Call him.

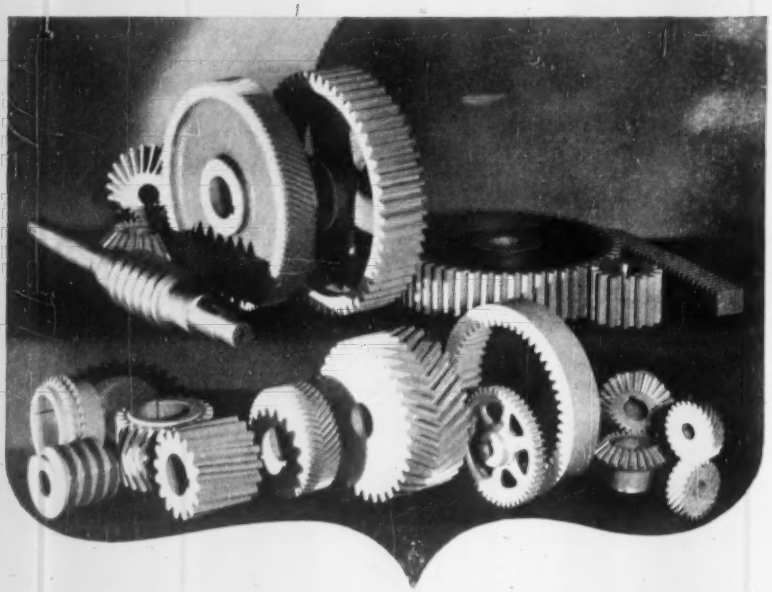
CLARK EQUIPMENT

ROSS CARRIER LINE
Industrial Truck Division
CLARK EQUIPMENT COMPANY
Benton Harbor 26, Michigan

INDUSTRIAL GEARS

for every purpose from

an ounce **to 20,000 lbs.**



• Whether you require Spur, Spiral, Herringbone, Bevel, Mitre, Internal or Worm Gears—Worms or Non-Metallic Pinions . . . here they are . . . the finest made. For over a half century Horsburgh & Scott has specialized in making gears that represent the best in engineering design, accurate workmanship and fine materials. Economical too, for they are standardized and built to endure. With a complete line of all types and sizes . . . here's one source for all gears and gear products.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for 488-Page Catalog 49

company makes electric display turntables, miniature electric motors and machine tool attachments.

Louis Levin & Son Inc. moved to 3610 S. Broadway, Los Angeles. The firm makes instrument lathes, microdrill presses and watchmaker tools.

ASSOCIATIONS

Gray Iron Founders' Society Inc., Cleveland, has launched its 1954 gray iron castings redesign contest. Purpose of the contest, says H. J. Trenkamp, president, is to encourage more extensive use of gray iron in products formerly manufactured by a competitive process. All entries in the competition must be submitted to the society's headquarters by June 1.

Resistance Welder Manufacturers' Association, Philadelphia, appropriated funds for grants-in-aid to university researchers in order to secure basic information of value to the resistance welding industry and to encourage the training of men in resistance welding research.

Dr. N. J. Grant, associate professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., will act as technical consultant for **Investment Casting Institute**, Chicago. Institute members will have the opportunity of submitting questions and problems on metallurgy and precision casting for answer by this noted authority in the field.

Radio - Electronics - Television Manufacturers Association, Washington, placed Virgil M. Graham, formerly of Sylvania Electric Products Inc., in charge of RETMA engineering department.

Lead Development Association was formed in England under sponsorship of leading Commonwealth producers of lead. The office is in London.

Paul W. Eberhardt, vice president, Walter Kidde & Co. Inc., Belleville, N. J., has been re-elected president of **Fire Equipment Manufacturers Association.**

Wire rope? What's that got to do with us?

WICKWIRE ROPE — A CF&I PRODUCT

A lot more than you might think, folks. Consider, for example, the heating in your home . . . the warmth that keeps *her* snug and comfortable through a wintry night. Whether you use coal, oil or gas, wire rope is an indispensable part of the equipment that probes the earth's depths to bring this comfort to you. Chances are, it may be Wickwire Rope. Because for over half a century Wickwire Rope has been an outstanding favorite with men in the mining and petroleum industries. Like users in numerous other lines of business, these men know that for unfailing performance, longer life and more economical service, there's nothing to match the quality and care that go into the making of WICKWIRE ROPE.

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

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PACIFIC COAST DIVISION: Los Angeles • Oakland
Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION: Boston • Buffalo • Chattanooga
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1792

WICKWIRE ROPE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

ROCKER AND SLIDE TYPES
FOR CUTTING

BILLETS • RAILS
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SQUARES • STRUCTURALS
SPECIAL SHAPES

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

STEEL

April 26, 1954

Technical Outlook

THREAD ROLLING— Landis Machine Co., Waynesboro, Pa., announces acquisition of American rights to a German thread roller. Called the "Pee Wee," the German machine employs two circular thread roll dies and a work support blade. Landis machine is heavier than the Pee Wee and should be available late this year. It is designed for either plunge or thru-feed rolling, and workpieces can be threaded automatically by hopper feed or semi-automatically by hand feed. Special threads can be rolled between centers to close tolerances.

SHELL MOLDING— Engineers at Westinghouse Electric Corp. are investigating the use of shell molding on their cast iron motor frames for the new NEMA sizes. Advantages appear to be better appearance and better dimensional control. Latter feature will result in some reduction of machining operations. Probable site for the method will be at the Attica, N. Y., foundry. Present plans are for shell molding to be used in conjunction with sand molding.

ATOM IN STEELMAKING— Armco Steel Corp. reports that a fission product of uranium is being used in a new gage that measures thickness of metallic coatings continuously on a rapidly moving steel strip. Initial application of the instrument is in the continuous zinc-coating process. The gage, a result of a three-year joint research program by Armco and Industrial Nucleonics Corp., Columbus, O., not only measures zinc coating thickness continuously, it does so along the length of the strip, across its width and on both sides.

WIRE PACKAGING— A new wire container, called Payoffpak, offers a different approach to some of the problems of drawing, packing, storing, shipping and dispensing wire. Continental Can Co. introduced the fiber drum as a part of a new wire-handling process developed by Driscoll Wire Co. Payoff system has a center core around which the wire is packed; a special hat attachment that fits over the core and acts as a guide for dispensing the wire; and a metal lid secured by a lever-lock metal band. Coulter & McKenzie Machine Co. was the first to build a complete drawing and packaging machine to load Payoffpaks. Firm also has a conversion attachment that can adapt most present wire drawing machines.

PLATING— A concentrated wetting agent is said to stop carryover of chrome-plating solutions. It's used in the still tank following the cold-running water rinse. Work is then given a cold-spray rinse followed by the final hot soak. Agent, used at a concentration of 16 ounces for each gallon of water, is a product of Magnus Chemical Co. Inc., Garwood, N. J.

COMPRESSOR MOUNTING STANDARD — Recommended revision of the commercial standard covering tank-mounted air compressors has been circulated to manufacturers, distributors and users. Pneumatic Automotive Equipment Association's revision includes changes in permissible motor loading, plus addition of $\frac{1}{2}$- and 15-hp sizes with 20 and 120-gallon minimum tank capacities.

SAFER GRINDING— Naval Ordnance Laboratory reports the Technical Shops Division's tool room is storing grinding wheels on edge instead of flat. Bureau of Ordnance safety inspectors say the wheels, especially larger sizes, are inclined to crack or warp when stored flat on shelves. At high speeds, even a small crack can mean an explosion that projects particles at high velocity. A specially-devised magazine rack takes care of shelf storage.

Metalworking Outlook p. 47 Market Outlook p. 133

ORIGINAL ANNOUNCEMENT of the chip breaker survey appears as a Technical Outlook item in STEEL, Nov. 9, page 111. This special article has been prepared in response to evident reader desire for chip-breaker recommendations.

The study was sponsored by the National Machine Tool Builders' Association and was undertaken at the Sibley School of Mechanical Engineering, Cornell University, in cooperation with Professors Erik K. Henriksen and Harry J. Loberg.

The Right Chip Breaker

A METALCUTTING MUST

Longer tool life, better machining tolerances and surfaces, easier chip disposal, safer machine operation—all benefits of good breaker design. Here are some tips on procedure

Fig. 2—Chip formation, left, at low cutting speed and, right, high cutting speed

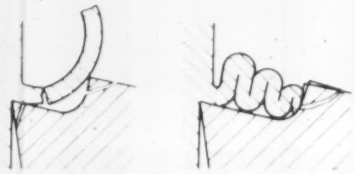


Fig. 3—Over breaking, crowding and tool breakage caused by too steep a slope

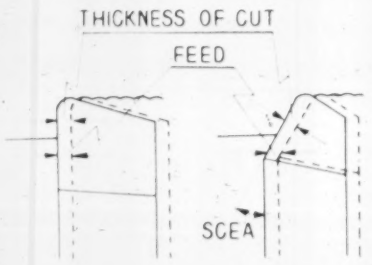


Fig. 4—Effect of a variation in the side-cutting-edge angle on the thickness of cut

METALCUTTING CHIPS are formed by a shear process. As the tool enters the work, compression takes place ahead of the cutting edge and, at a critical shear value, plastic flow occurs along a plane running from the cutting edge of the tool to the work surface.

Brittle materials fracture ahead of the tool. A discontinuous chip is formed. This type chip contains many cracks and is easy to break.

Ductile materials can be strained in shear to a high degree without rupture and they form a continuous chip when machined. At low cutting speeds such chips are strain hardened and have a natural curl which aids in chip control. High velocity turning with carbides, however, produces a thin, ductile chip which is difficult to control and is dangerous to the operator.

Control Factor—Efficient chip breaking is then an important phase of every single-point machining operation. The chip breaker should be designed to operate satisfactorily with the cutting condition prescribed for the job. Improper chip breaker design is the source of many tooling problems.

A narrow breaker which is producing splinter chips can lead to: 1. Chatter in the machining operation. 2. Poor surface finish. 3. Broken tools, or 4. Failure to meet rates due to having to reduce the feed.

Misnomer—To obtain the desired degree of chip breaking, two factors must be considered: The feed rate, and the radius through which the chip is bent.

The term chip breaker is slightly misleading, for the primary purpose of the breaker is to curl or bend the chip. Once the chip is bent it will strike the transient surface of the work and break into regular uniform chips.

Chip Range—In forming the chip-flow chart shown on the next page, practical limits were placed upon the basic type of chips acceptable for production turning. First stage of breaking was considered an infinite helix. Complete chip breaking is obtained when chips of one full turn are produced. Upper limit is where one-half turn chips are obtained.

Overbroken chips, that is chips that appear as fragments or splinters, should be avoided as they induce chatter and result in short tool life.

Feed Effect—Each chip breaker can be used within a range of feeds which will give complete chip breaking. Below this feed range a snarling chip is obtained. Above the range overbroken chips are produced.

Since the chip can be varied by changing feed, a range of feeds can be established that will give satisfactory performance based on the chips produced. Chip breaker charts give feed ranges within which complete chip breaking is obtained for a given radius of bending.

Radius Is King—When selecting the proper size breaker, it is important to realize that the same amount of bending will produce the same degree of chip breaking.

Regardless of the width or depth of the breaker, proper chip control will be realized, if the radius of bending has remained constant. For economical grinding, general practice is to hold the breaker depth to a practical minimum.

Other Variables—Chip breaking is also influenced by lead angle, surface speed and depth of cut. As the lead angle increases, a heavier chip is produced which requires less energy to break. As the depth of cut increases, direction of chip flow changes. Heavy depth of cut, above 0.750-inch, produces a loose chip which is more difficult to break.

Chip breaker is more effective with reduced speeds below 400 sfm. Above 400 there is little change in the chip breaking.

Altered Feed—Negative rake tools produce a thicker chip which is easier to break. Negative rakes and heavy feeds are not, however, a solution to chip control. Such a cutting condition, though satisfactory for many turning operations, results in undue tool pressure and distortion during the machining.

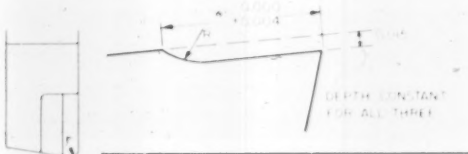
Feed modification chart, p. 101, shows the influence of the above machining variables on chip breaking. A modified feed based upon the effect of these factors should be used in determining the proper bending radius.

Warnings—Design of the breaker requires considerable care to avoid tool breakage. Fillet radius must be held within the specified range (table p. 101). A small fillet radius will lead to immediate tool breakage due to a stress concentration at the heel of the breaker (Fig. 3). On heavy cuts, feed should not exceed the flow width of the breaker.

Proper side rake angle of the tool is determined by the floor

Fig. 5 Chip types, left to right, snarling, regular intermittents, full turns and half turns

Fig. 6 General-purpose tool recommendations

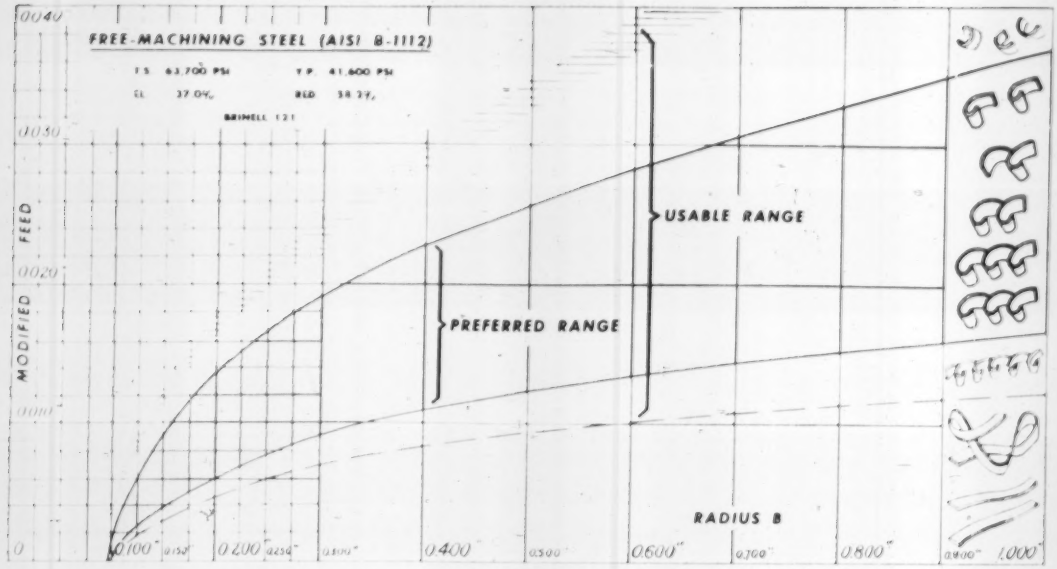


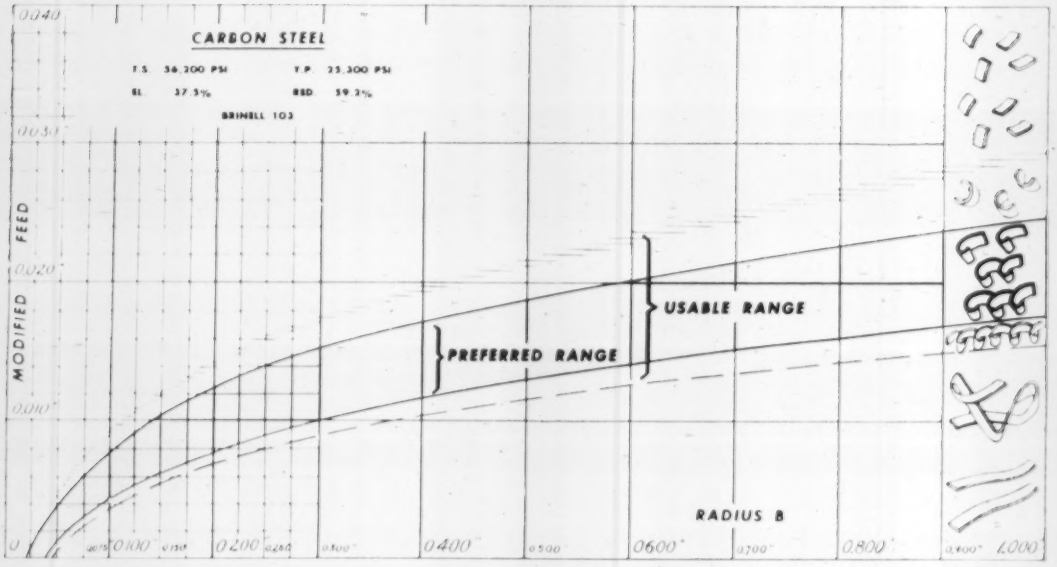
CHIP BREAKER DATA

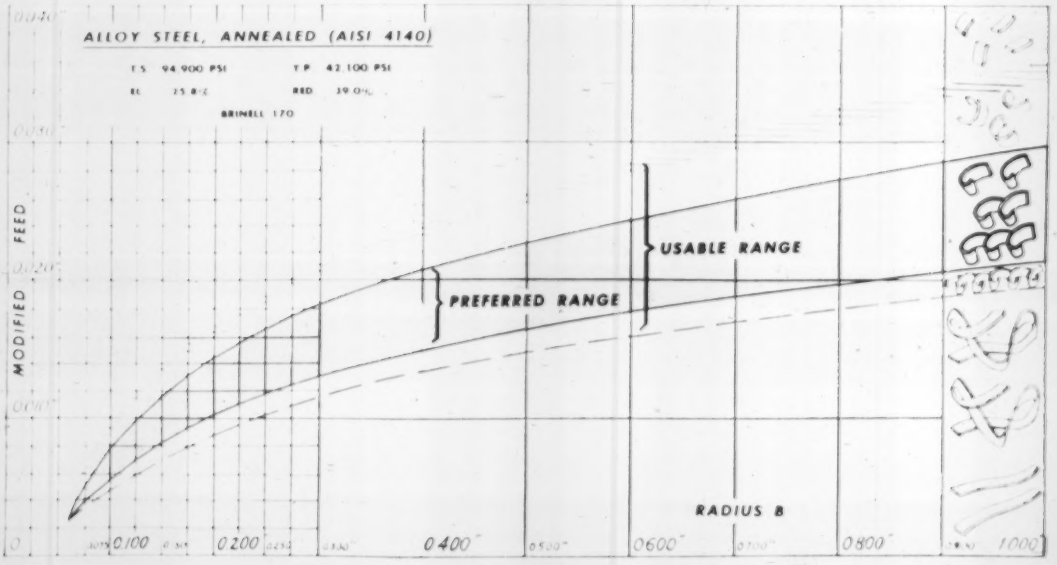
Tool No.	Nose Radius	Fillet Radius R inch	Width W inch
1	1/32	0.035-0.050	0.054
2	1/16	0.035-0.060	0.086
3	1/8	0.035-0.090	0.122

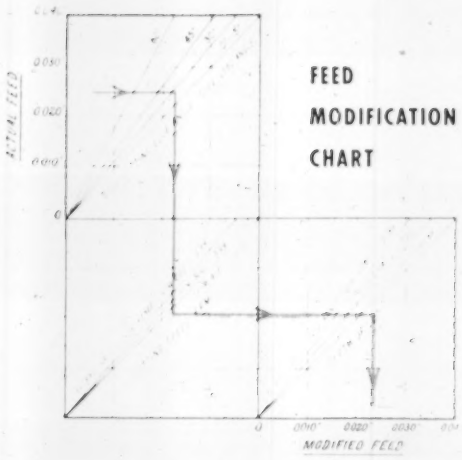
FEED RANGES FOR GENERAL PURPOSE TOOLS

Steel	Tool No.	Feed Ranges (ipr) A Initial	B Complete	C Advanced
1140	1	0.005-0.0075	0.0075-0.009	0.009-0.012
8640	2	0.009-0.012	0.012-0.015	0.015-0.020
1145	3	0.015-0.019	0.019-0.023	0.023-0.030
C 1037	1	0.004-0.006	0.006-0.008	0.008-0.012
1041	2	0.008-0.011	0.011-0.014	0.014-0.019
	3	0.012-0.015	0.015-0.022	0.022-0.030
B 1112	1	0.002-0.005	0.005-0.007	0.007-0.010
B 1141	2	0.005-0.010	0.010-0.014	0.014-0.018
B 1117	3	0.009-0.018	0.018-0.025	0.025-0.030

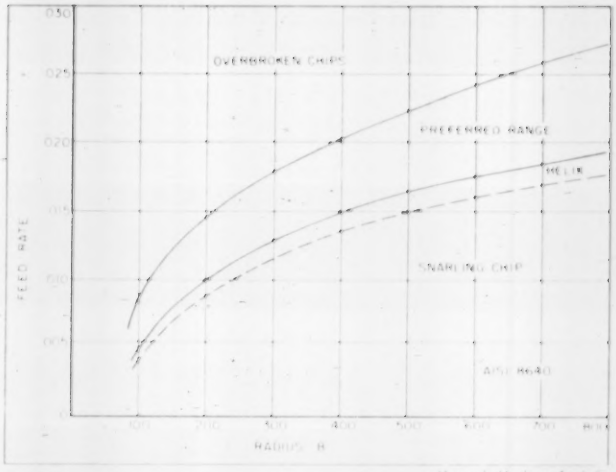

FREE-MACHINING STEEL (AISI B-1112)
T.S. 63,700 PSI
Y.P. 41,600 PSI
EL. 37.0%
RED. 38.2%
BRINELL 121
MODIFIED FEED
USABLE RANGE
PREFERRED RANGE
RADIUS B
0100"
0200"
0400"
0600"
0800"
1.000"


CARBON STEEL
T.S. 56,200 PSI
Y.P. 25,300 PSI
EL. 37.5%
RED. 59.2%
BRINELL 103
MODIFIED FEED
USABLE RANGE
PREFERRED RANGE
RADIUS B
0100"
0200"
0400"
0600"
0800"
1.000"


ALLOY STEEL, ANNEALED (AISI 4140)
T.S. 94,900 PSI
Y.P. 42,100 PSI
BRINELL 170
MODIFIED FEED
USABLE RANGE
PREFERRED RANGE
RADIUS B
0100"
0200"
0400"
0600"
0800"
1.000"



Obtain modified feed from table, above, and then proceed to charts at left to determine proper bending radius, B. Bending radius may then be expressed in terms of breaker height (h) and width (w) using table below



Sample chart prepared for AISI 8640. Charts for individual jobs may be simply plotted. See text for method

Conversion of B to w and h

(All dimensions in inches)

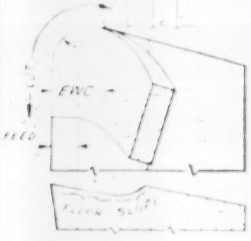
Chip Breaker Height h	B
0.015	
0.020	
0.025	
0.030	

Recommended Fillet Radii in Relation to Height of Chip Breaker

h	0.015"	0.020"	0.025"	0.030"
R_{min}	0.035"	0.060"	0.060"	0.070"
R_{max}	0.045"	0.080"	0.100"	0.125"

DEPTH OF CUT	0–1/8"	1/8"–1/4"	1/4"–3/8"	3/8"–1/2"
NOSE RADIUS r	1/32"	3/64"	1/16"	3/32"

Recommended Nose Radii



and not the heel angle of the breaker. The radius of the tool should be held to a minimum so that the effective width of cut does not exceed the floor width of the breaker.

Practical Limits—For production turning it is desirable to have a simplified form which can be used in the shop to select a chip breaker for a given job. Such a system must keep to a minimum the number of types of tools and tool grinds required.

A. B. Albrecht, metallurgical engineer, Monarch Machine Tool Co., Sidney, O., comments, "Chip control can be obtained for most turning conditions using one of three general purpose tools. The size breakers for those tools are shown in Fig. 6. Table gives the feed ranges within which these tools break a given type chip. Note that with three tools we take care of all chip breaking between 0.005 and 0.030-inch feed for 0.40 per cent carbon steels. Three other tools each apply to sulphurized and plain carbon steels.

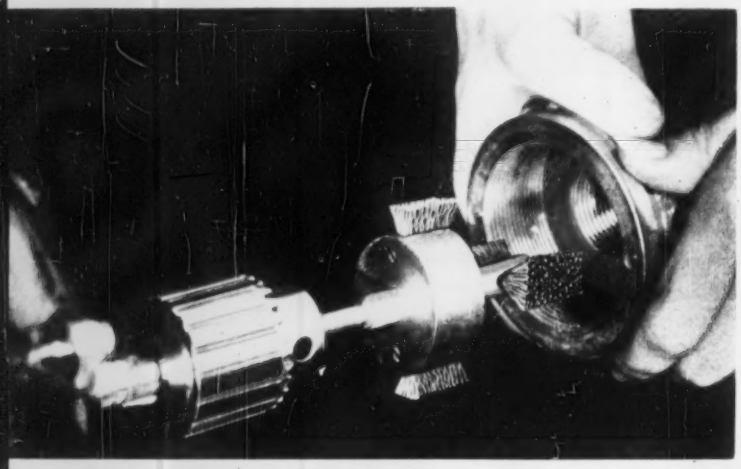
"These breakers have been tested in our plant and we find they do an excellent job under average production conditions. Some high-speed tracer work requires special attention due to the nature of the work cycle. In such cases the procedure outlined with the feed charts is followed for obtaining the proper bending radius. This radius is converted into the chip breaker dimensions using the table. For best tool life, feed line should be extended over to the base line of the preferred range. Operating in the center of this range results in a narrower breaker which may cause tool chatter and breakage."

Custom Made—Feed vs. B charts can be worked out by taking test cuts with three cutters with known radius B. Vary the feed and plot points where helixes and where half-turn chips are formed. Line connecting helixes forms base line of preferred range. Line connecting half-turn points forms upper line. (See sample illustrated above.)

Big Job . . .

Only the surface of the power brushing job potential has been scratched. Almost limitless adaptability of the technique is seen in jobs illustrated and described here

A ½-inch diameter wire brush fitted on a drill press removes the burrs from the inside of a small part



This arrangement of small brushes is used to clean internal threads. Two thread diameters are brushed at once

This special-purpose end brush mounted on an electrically-driven hand tool, cleans carbon from motor blocks

POWER BRUSHES, many no larger than the end joint of a finger, are finding industrial applications on work that often had never been done satisfactorily because of excessive cost.

Jobs to which these brushes are applied enjoy a steady increase because of brush adaptability made possible by use of properly designed holders. The latter often permit stock brushes to be used in a way that enables them to contact many surface areas otherwise difficult to reach because of shape and position.

Used alone or in holders, singly or in multiples, brushes can be versatile production tools. The chart shows how in some typical applications. Review of the chart and illustrations of single and multiple brush holders should engender some ideas on other types of limited clearance work or on work where shape of part will not allow use of conventional brushes.

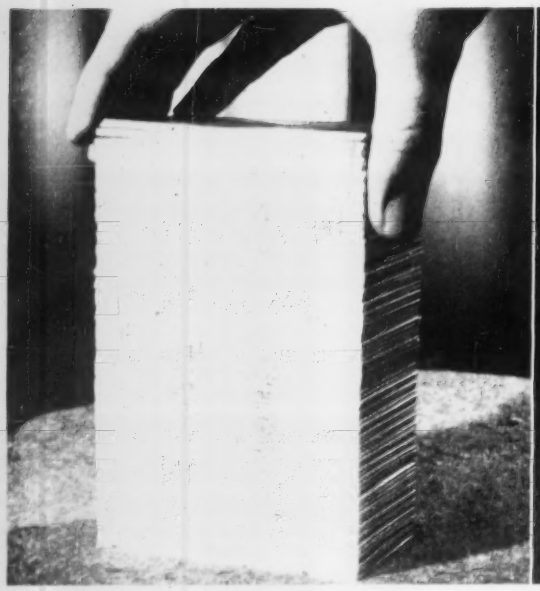
For Small Brushes

REPRESENTATIVE APPLICATIONS

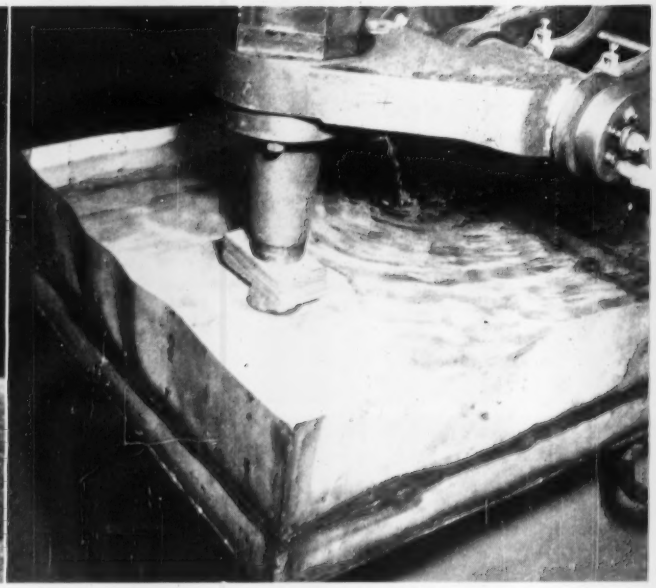
With Summary of Brush Cleaning Results . . .

ARTICLE	OPERATION	BRUSH SIZE	BRUSH MATERIAL	SPEED RPM	COMMENTS
Various aircraft engine parts	Thoroughly clean and finish drilled holes, remove burrs and chips.	1/4 3/8 1/2	0.005 SA wire	25,000	Work done well and fast and eliminated bottleneck of serious nature.
Electrical fixtures	Preparing copper terminals for soldering.	1/2	0.005 SA wire		Two brushes used simultaneously in holder, made the job practical where no other stock brush could be used. Highly satisfactory results obtained and only 3 seconds required to brush one part.
Rubber covered flexible tubing	Remove excess rubber from interior to expose braided wire.	7/8	0.005 SA wire	3500	Small brushes were able to brush the tubing in less than 4 seconds. Each brush completed 300 ends.
Various steel parts	Remove medium sized burrs and chips from threaded holes.	3/4	0.010 SA wire	3450	55% savings in time compared with old method.
Magnesium and aluminum motor blocks	Clean oil holes in motor blocks.	3/4	0.005 SA wire	1750	Cleaned 4 times as many holes per hour as with previous method.
Spark plug	Remove carbon and lead deposit from ID of spark plug shell.		0.005 SA wire	1290	Quality of work improved. Only 20 seconds required per piece.
Optical instrument cases	Cleaning.	1/4	0.005 SA wire	3500	Replaced a laborious hand method of scraping.
Small gears after heat treating	Remove heat scale and white lead composition from arbor holes of small gears.	3/8 1/2 5/8 3/4	0.005 SA wire	1750	Cleaned better than the method previously used. Previous abrasive filled up quickly, then would not clean satisfactorily.
Aluminum fuse body	Remove burrs and chips from threaded holes.	3/4	0.005 SA	3450	Parts brushed in one-third less time.
Supercharger casing casting	Deburr and clean intersecting oil holes.		0.005 SA wire	1800	Brushes saved $20,000 in stopping rejections of castings due to burrs.

Based on information Compiled by Osborn Mfg.



These 89 sheets of titanium were melted down to form an ingot 6 inches thick. Metal then can be machined



Close up of the tank. Shown are the upper and lower electrodes and metal. Steel scrap also can be used

A Way to Use Titanium Scrap

Solid ingot of metal is formed by resistance spot welding a thick stack of scrap sheets submerged in liquid. Coolant solves the oxidation and heat problems

MARTIN Aircraft Co. has a process that redeems practically all its scrap titanium sheet.

A solid ingot of virgin metal is formed by resistance spot welding a thick stack of sheets submerged in liquid. At least as strong as the parent metal, the ingot is machined into scarce hardware or aircraft parts.

Process is basically like conventional resistance welding. By adding a tank to the machine, where two electrodes and material to be welded meet in liquid, oxidation and heat problems are licked and machine capacity is increased. Owing to the cooling effect of the liquid, thickness of the weldable laminate has been upped to 6 inches for titanium and 3 inches for stainless steel.

Here's How—The mechanics are simple. In a typical operation, sheets are de-oxidized in an aqueous solution of 2 per cent hydrofluoric acid and 10 per cent nitric acid. A 100-kva, Sciaky, three-phase welding machine is used. Mallory 3 electrodes are 2½ inches in diameter, with a radius of about 20 inches.

Bottom electrode protrudes into the bottom of the tank; top electrode is just submerged in the liquid. Control settings are:

Weld, 69 per cent; weld Vernier, 43 per cent; pressure, constant high 19,500 pounds; weld heat, 6 cycles; cool time, 2 cycles; and weld time, 15 seconds on multiple impulses.

Results — In the example, 85 sheets of 0.064 titanium, with two sheets of 0.092 on top and bottom, were resistance spot welded. ASTM tensile-test specimen was machined from the ingot. Here's how results compare with those of the parent metal:

Parent metal tensile strength, 80,000 psi min; ingot, 92,000; yield strength of parent metal, 70,000 psi min; ingots, 73,700; elongation of parent metal, 15 per cent min; ingot, 17 per cent.

Prospects—Tool engineers may use the process in the fabrication of built-up tools presently machined from bar stock. Savings in time and money can be realized through resistance spot welding laminated sections in different thicknesses.

Martin sees the day when the process can be used to fabricate complex turbine wheels in one integral unit, in the production of heavy bomber wings now made of thick rolled metal or even in the formation of whole wings.

Resistance seam welding in liquid is being looked upon as a possible way to produce long ingots that can be machined into wing spars or similar items. In prototype aircraft especially, this would provide great savings.

This 25-ton induction stirrer is fastened to the bottom of a 90-ton capacity electric arc furnace.
ELLIOTT
One of the coils for the stirrer, made of Revere rectangular copper tube. Coil is 12 feet long, over 6 feet wide.

Revere Copper helps stir molten steel

When steel is produced in an electric arc furnace it is highly desirable to stir the molten metal, to assure uniform heat and avoid stratification of the various alloy constituents. Manual and mechanical methods have been used, but the most modern method is electrical—induction stirring. This is accomplished by sending low-frequency two-phase currents through copper coils immediately under the furnace. The magnetic field thus produced stirs the melt most effectively. Stirring can be reversed, and the contents of the furnace made to flow toward either the slag door or the pouring lip.

Because of the heavy currents required, copper's high electrical conductivity makes it essential. Since the stirring coils are close to the furnace, they must be water cooled, distilled water being used in a closed system. Copper's high thermal conductivity is vital here. The basic copper for the stirrers made by Elliott Company, Ridgway, Pa. for Arcos Electric, Inc., New York, is Revere rectangular tube, .945" x .750", .157" wall. Elliott and Revere technical personnel worked closely on the problem of specifications, arriving at joint agreements on tolerances and temper suitable for bending. These proved successful from the start, again showing the value of close collaboration between Revere and its customers . . . If you have a problem in connection with copper and its alloys, and aluminum alloys, consult Revere. See the nearest Sales Office.

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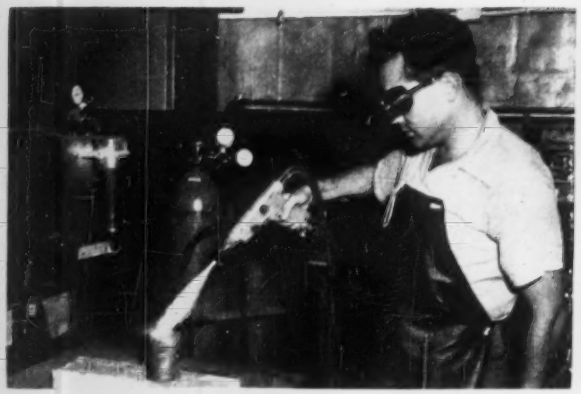


Flame-spraying technique is used by Ryan ceramicist to coat stainless steel parts with powdered cermets

Flame temperatures hit 3500 F in these afterburners which were built for General Electric J-47 engines

FLAME SPRAYING

. . . ANSWER TO CERAMIC COATING PROBLEM

Ryan has success spraying nickel-magnesia on high temperature alloys at oxy-acetylene temperatures of 5500 F. Ceramic fuses, but part doesn't heat up as much

STILL in the research phase, flame-spraying is a spectacular operation in which powdered refractories can be momentarily liquefied and sprayed on metal surfaces. For this work, Ryan Aeronautical Co., San Diego, Calif., uses a spray gun which is designed for metal spray-welding purposes. Laboratory technicians have converted it to the application of cermets or combination metal-ceramic powders.

Ryan has successfully flame-sprayed the promising cermet, nickel-magnesia, as a coating on stainless steel, inconel and other high temperature alloys. This cermet is made from nickel and magnesium oxide which have been combined, sintered and ground to powder. It has demonstrated its capacity as a coating to withstand temperatures up to 3500 F for limited periods.

Others Didn't Work — With a very high fusing temperature, nickel-magnesia cannot be applied to metal structures by ordinary furnace fusing methods. Ordinary furnaces will not provide temperatures above 2100 F. Specially insulated furnaces are expensive and difficult to design and operate for handling sizable parts. Another drawback is that jet engine alloys cannot stand the necessary fusing temperatures without losing strength and suffering other undesirable physical changes.

Flame-spraying circumvents these obstacles. The technique heats the cermet to the fusing point without bringing the base metal, to which it is applied, close to dangerously high temperatures. It avoids the use of expensive furnace equipment.

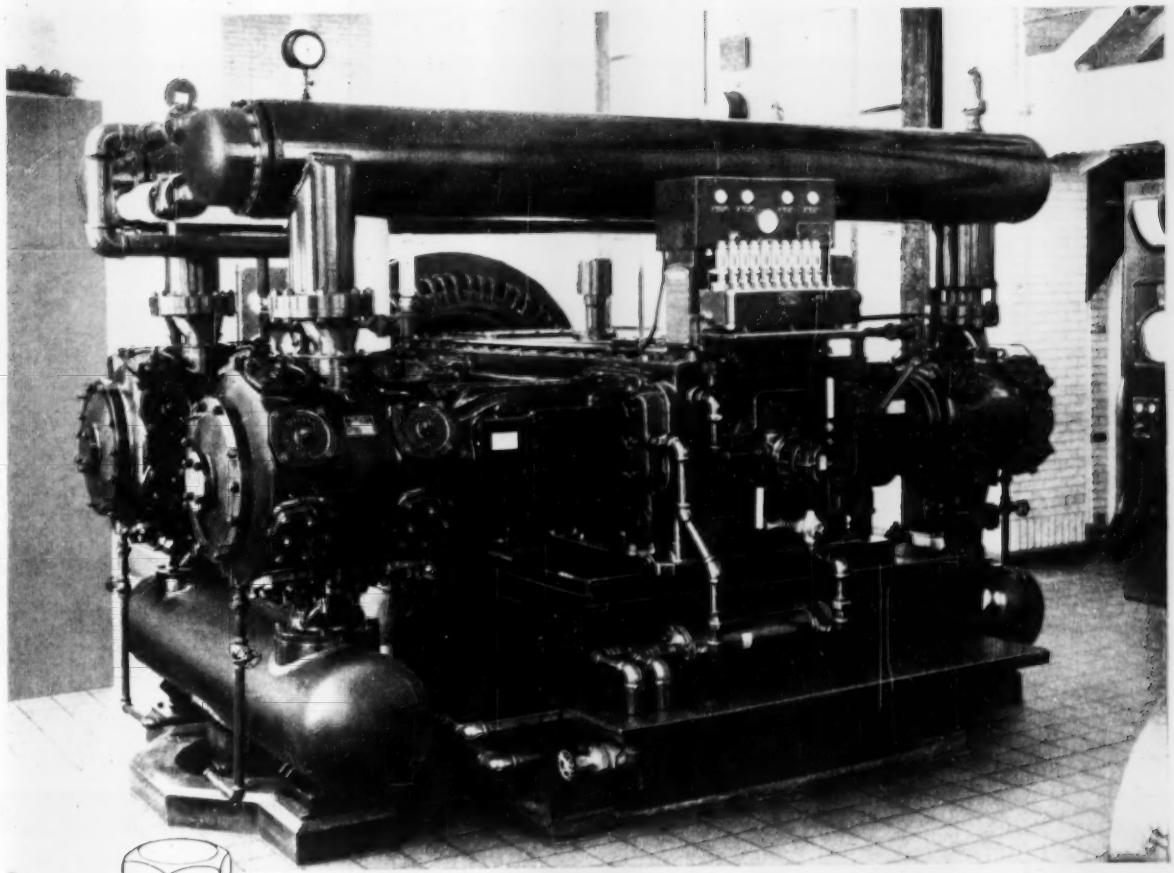
Like Fiery Paint—The nickel-magnesia powder is placed in a metal container attached to the flame-spraying gun. Nitrogen gas forces the powder through a tube and into the hot torch nozzle. Oxygen and acetylene are also piped to this nozzle where they burn with a temperature of 5500 F. As the cermet flows through the hot flames it liquefies and is sprayed on the metal surface, like a fiery paint.

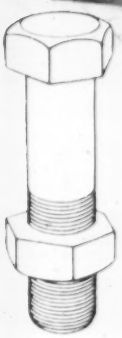
Leaving the flame area and impinging upon the cooler metal, the cermet cools, solidifies and adheres in a refractory coating which can be applied to prescribed thickness. The base metal is not heated to temperatures which could cause warping or buckling.

The flame-spraying gun is light and dependable. Four valves control the flows of oxygen, acetylene, cermet powder and nitrogen. Care must be taken to obtain uniformity in coating thickness. Ryan has applied the coating in various thicknesses ranging from less than 0.001 to 0.020 inch.

Immediate Applications—Flame-spraying cermets, as coatings, may open new vistas of usage for after-burner liners, rocket parts and other similar high temperature components. These parts are called upon to withstand terrific heat and high velocity impingment of corrosive gases, but are not required to have high structural strengths.

For use with high strength components, such as combustion chambers, transition liners and exhaust systems, cermet coatings may be the means for extending operating temperatures by as much as 150 F.





JUST BOLT IT TO THE FLOOR

that's all Ford had to do

Expanding operations at Ford Motor Company's assembly plant in Buffalo, N. Y. demanded additional shop air capacity. It had to be installed quickly and, if possible, without disruption to existing facilities.

Inasmuch as the installation was to be on the second floor of the power house, Ford engineers selected a Clark CMA-4, 350 horsepower, Balanced Opposed Compressor. The low installation cost was an important factor.

With the Clark motor-driven unit, it was unnecessary to run foundations all the way down to the basement. Piping, which was beneath the proposed compressor location, did not have to be moved.

Because of the perfect balance of the Clark unit, it was possible to mount the motor and compressor on a steel sub-base which was bolted to floor I-beams. No foundations were required. No pipes were relocated.

. . . nor was there any lost production. The Clark unit was tied in over a weekend.

The Buffalo assembly plant is but one of many Clark Compressor installations serving the Ford Motor Company's vast operations.

Before you consider any proposed compressor location *impossible*, it may save you money to talk it over with your nearest Clark representative. In the meanwhile, make sure you have Bulletin 118 in your files. Write today.

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Design for better seeing

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source that is commonly available, provided it meets design requirements satisfactorily. This is obviously true not only because such a lamp is easy to obtain for replacement purposes, but will be more economical to buy.

Three basic light sources commonly available are the incandescent, fluorescent and gaseous discharge. Electroluminescence is a relatively new basic light source that shows promise. Comparative evaluation of the incandescent and fluorescent sources is found in Table II.

Light Control — After light source selection, the primary design problem is control. Few lamps have desired characteristics of brightness, color, shape and candlepower distribution suited for direct application without control or modification. To obtain proper light distribution and color, the designer must work with many types of reflecting and transmitting materials.

Materials that can be suitably employed as light reflectors range from the shiny or specular types, which include mirrored glass or polished aluminum, to the diffusing ones such as flat white paint. In between are the spread types like brushed aluminum and the diffuse-specular materials. Porcelain enamel is commonly used in industrial fixtures and is primarily a diffuse coating, but a specular component results from the shiny surface glaze.

Industrial fluorescent luminaires are usually applied in three finishes — Alzak aluminum, white porcelain enamel and white baked enamel. The Alzak aluminum finish provides a lower brightness inside the luminaire with a slight sacrifice of luminaire efficiency. Reflection factor is 70 to 80 per cent. White porcelain enamel is quite durable and easy to clean and has a reflection factor near 80 per cent or higher. Most of the white baked enamel finishes have reflection factors between 80 and 90 per cent and higher.

Designing for Illumination—Se-

TABLE II

ADVANTAGES OF INCANDESCENT LAMPS

1. Commonly available and inexpensive
2. Simple to install and maintain—no ballasts or starters needed
3. Designed for wide voltage range
4. Efficient at low temperatures
5. Rugged at low voltages
6. Operate well on ac or dc
7. Concentrated light source permitting ease of light control
8. Air temperature and circulation has little effect on light output
9. Start reliably at any temperature
10. Lamp life unaffected by intermittent duty

DRAWBACKS OF INCANDESCENT LAMPS

1. Low efficiency at standard voltages in comparison with same wattage mercury vapor or fluorescent lamps
2. High heat generation
3. Fragile filaments in higher voltages unless specially mounted
4. Short life — usually 750 to 2000 hours
5. High brightness

ADVANTAGES OF FLUORESCENT LAMPS

1. High efficiency
2. Low brightness
3. Low heat generation
4. Resistant to shock and vibration
5. Long life—6000 to 10,000 hours

DRAWBACKS OF FLUORESCENT LAMPS

1. Complicated circuits and many components
2. Do not operate on low voltage
3. Do not operate satisfactorily on dc
4. Light output affected by air temperature and air circulation
5. Large in size for light output

QUALITY OF LIGHT

TABLE III

Brightness and color of the light source and area surrounding visual tasks control quality of illumination. Here are several factors the designers must consider.

BRIGHTNESS RATIOS— Limitations on ratio of brightness in various parts of visual field must be made to help insure seeing comfort. For seeing areas in field of view, the following limitations are given:

1. Brightness of critical seeing area, which extends out to a visual angle of about 60 degrees, should not be more than three times brightness of immediate surrounding area which extends to about 120 degrees.

2. Brightness of critical seeing area should not be more than ten times brightness of area outside that immediately surrounding. Such brightness ratios are to be considered maximums and reductions generally are beneficial.

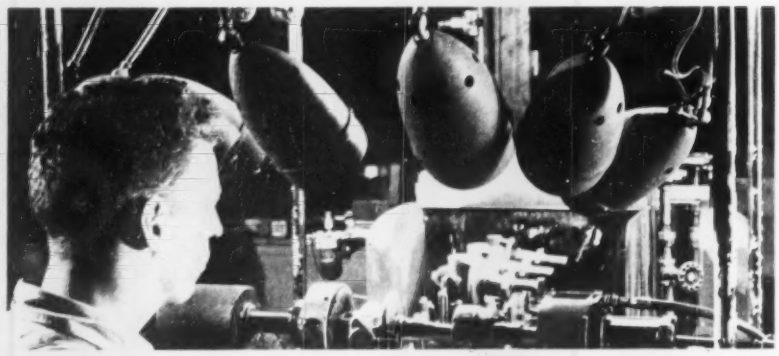
GLARE—Excessive brightness in the direction of the eye must be prevented or compensated for by increasing adaptation brightness and or glare source surround brightness. The light source itself must be shielded or louvered to keep uncomfortable brightness out of the eye as much as possible.

COLOR OF LIGHT— Tests have shown that different color qualities with equal intensity lighting have little effect on visibility. For most machine lighting, built in for illumination, colored sources produce no magical increase in comfort or decrease in physical fatigue as is sometimes claimed.

SHADOWS—Prevention of shadows with built-in lighting is desirable, except where silhouettes of details are required. Silhouette lighting is restricted mostly to visual indication. Shadow elimination is one important reason for building light into many machines, especially machine tools.

FINISHES— Reflectances of the finish on most machines, instruments, test equipment, instrument and control panels should range from 20 to 50 per cent. In areas where most of the visual work is done, reflectance values should be at least this high to decrease brightness ratios. Another important advantage of a high reflectance finish is that it permits most efficient use of available light from both general lighting and built-in lights.

built-in lighting . . .



Design for better seeing

Improved operation, ready customer acceptance go along with better illumination. Here are some steps to follow to make seeing a part of design

By ROBERT C. RODGERS

IMPROVED LIGHTING in machines today is achieved largely through increased attention in initial design planning. Ideal lighting conditions are limited only by knowledge of seeing and basic design factors concerning light and its control.

To design lighting equipment most effectively into a particular machine, careful evaluation of the seeing requirements must be made to obtain light with color, brilliance and directional distribution characteristics most suitable for the operating conditions. Engineered lighting offers the most satisfactory results in all cases.

In effectively integrating lighting with machines, application of light for visual indication should also be considered. This important use is included in design of a majority of mechanical units manufactured today. In this function, signal and pilot lights permit quick observation of conditions in a machine at many points that are vital to proper operation.

What Is Good Lighting? — Research indicates the desirability of 50 to 2000 footcandles of illumination for various jobs to obtain maximum human efficiency, with minimum fatigue. Specific illumination values depend on individual seeing requirements and limitations.

In many outdoor work areas it is usually not practical or economical to obtain illumination values much above 100 footcandles from lighting systems mounted on ceilings, walls, poles, etc. In fact, many general lighting systems still exist in factories and laboratories that provide only 5 to 20 footcandles to horizontal work surfaces. Of course, only a fraction of that amount can illuminate inclined, vertical and interior parts of machines used in such places.

Therefore; besides assuring adequate light for proper machine operation and maintenance, built-in lighting makes it possible to provide additional illumination in quantities from 50 to 2000 footcandles on any desired machine work plane in an easy and economical manner.

Built-In Benefits—In industrial machinery, for example, properly designed built-in lighting can provide greater operator convenience whereas dangling or excessively-protruding hung-on lighting equipment may actually hinder more than the added light can help.

In addition to basic advantages, well-designed lighting invariably results in greatly-improved appearance and customer acceptance.

Light Sources—Selection of the right lamp for a specific application is one of the most important decisions to be made in the design of built-in lighting. The designer is wise to select a light

TABLE I

RECOMMENDED ILLUMINATION LEVELS FOR MACHINES

Type of Work	Illumination* (ft-c)
Rough	20
Medium	50
Fine	100
Extra fine	300

*These are footcandles maintained in service. Initial values should be 25 to 100 per cent higher to compensate for lamp and room depreciation.

source that is commonly available, provided it meets design requirements satisfactorily. This is obviously true not only because such a lamp is easy to obtain for replacement purposes, but will be more economical to buy.

Three basic light sources commonly available are the incandescent, fluorescent and gaseous discharge. Electroluminescence is a relatively new basic light source that shows promise. Comparative evaluation of the incandescent and fluorescent sources is found in Table II.

Light Control — After light source selection, the primary design problem is control. Few lamps have desired characteristics of brightness, color, shape and candlepower distribution suited for direct application without control or modification. To obtain proper light distribution and color, the designer must work with many types of reflecting and transmitting materials.

Materials that can be suitably employed as light reflectors range from the shiny or specular types, which include mirrored glass or polished aluminum, to the diffusing ones such as flat white paint. In between are the spread types like brushed aluminum and the diffuse-specular materials. Porcelain enamel is commonly used in industrial fixtures and is primarily a diffuse coating, but a specular component results from the shiny surface glaze.

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ENVIRONMENTAL CONDITIONS

TABLE IV

Almost limitless in number and variety, conditions of environment have considerable influence on design of lamps and fixtures in machines. Here are some of the more important facets to consider.

TEMPERATURE— In dealing with this aspect, temperature of surrounding liquids and gases, lamps and the machine itself, all play important roles. For low and high temperature conditions, built-in fluorescent lighting should be discouraged, unless enclosed.

AIR CIRCULATION— Fluorescent lamps are less efficient in heavy drafts. This can be handled easily in original design by specifying enclosed luminaires with glass or plastic bottoms for protection from cooling effect of high velocity air streams. Filament and mercury vapor lamps are not so limited regarding temperature or air circulation.

HUMIDITY— Few problems exist with any of the light sources in this aspect. It would be desirable to enclose lamps completely in high-humidity areas, but this is usually not necessary.

DUST AND DIRT— Reflector and PAR lamps are naturals for dusty and dirty areas because it is simple to clean their smooth glass surfaces. Glass and plastic bottoms on fixtures for any of the lamp types make it possible to maintain high light output in dirty environments because of cleaning simplicity.

FLYING DEBRIS, IMPACT— This includes bulb breakage by such items as flying metal fragments, dry and liquid abrasives and simple accidental impact. It is usually necessary to specify hard glass lamps or to use fixtures or globes made of plastic or hard glass. On many machines, metal fixtures or guards are used to protect lamps from breakage.

CORROSION— Liquids and gases that are corrosive must be guarded against by specifying well-sealed lamp sockets or completely-sealed fixtures. Sealer must withstand corrosion characteristics of liquid or gas, especially the acidic or alkaline varieties.

VIBRATION AND SHOCK— Concern is for light failure from lamp filament breakage. Fluorescent lamps have sturdy filament designs and should be used in areas where general service lamps will not hold up. If heat and power consumption are important, use of fluorescent lamps should be considered. Shock and vibration can be dampened by such techniques as mounting lamps or fixtures on springs and in or on rubber or plastic.

HAZARDOUS LOCATIONS— For Class I locations, lamps are encased in heavy metal and glass luminaries. These prevent hot gases caused by possible internal explosions from reaching surrounding atmosphere at sufficiently high temperatures to create external explosions. In Classes II and III, luminaire shape reduces accumulation of combustible materials. Also, luminaires are usually larger than those employed in Class I. This provides sufficient radiating surface to prevent high concentrations of heat from the lamp.

lection of a lamp and methods for controlling its light output are dependent on many environmental and physical construction details. These are outlined in Tables III and IV. If the need for lighting exists in a machine, then the function of the light becomes a major factor controlling the design planning for this lighting.

Light source and luminaire selection are primarily dependent upon the number of footcandles required for a particular visual task. Visibility is a function of several basic characteristics of the object or detail being seen in its background. These include size, shape, reflectance or transmittance, time, color and brightness.

In machining a part, assembling a product or operating a data computer, for example, size and shape of centering marks on the part, components put into the product or numbers fed to the computer are rather definitely determined and fixed in size and shape.

Factor of Brightness—Reflectances or transmittances of vital details and their backgrounds along with their colors seldom can be changed, except in a few cases, to improve seeing. The eye operates quickly, thus increasing time for seeing does little to increase visibility after a few seconds or, in most cases, a fraction of a second.

Therefore, the designer usually has little influence over the first five characteristics. But he can control the factor of brightness. By adding footcandles, brightness differences[1] between objects and their backgrounds are increased with resultant improvements in visibility. Illumination required for machine lighting[2] applications is listed in Table I.

Designing for Indication—Advantages of incandescent lamps used for visual indication are that they are bright and adjustable in brightness, and are available in many sizes and voltages. Disadvantages include relatively fragile filaments and short life. On the other hand, neon lamps are rugged, reliable, require little power and have long life. But they're only available in limited sizes, brightness or colors. In addition, neon lamps require 65-v ac or 90 v ac to glow.

The designer can easily select the type and size of indicator light assembly by determining the space, color, brightness, mounting, reliability and maintenance requirements. There are few hard and fast rules of color selection; in many cases selection depends on complexity and use of machine.

Reliability, Maintenance — High reliability and easy maintenance are important. A valuable machine may depend on one indicator light always functioning. Thus, it is good design to build in two lamps for the same indicating function.

Biggest maintenance concern is lamp replacement in case of a burnout. Many pilot and dial light assemblies have removable caps to insure ease and speed in lamp replacement. If these are not employed, design of machine and location of indicator lights should be such that lamps are readily accessible from inside the unit. Alternatives are to mount indicator lights on removable or hinged panels.

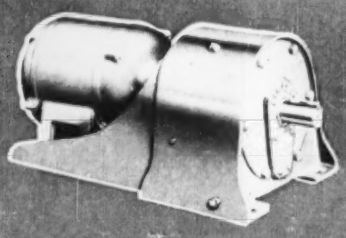
1. S. K. Guth, A. A. Eastman, and R. C. Rodgers, "Brightness Difference: A Basic Factor in Suprathreshold Seeing," *Illuminating Engineering*, Vol. 48, No. 4, May, 1953. Page 233.
2. *IES Lighting Handbook*, Illuminating Engineering Society, New York, 2nd edition, 1952. Table 9-18. Pages 9-63-68.

Adapted from an article by Robert C. Rodgers, in the February, 1954, issue of MACHINE DESIGN.

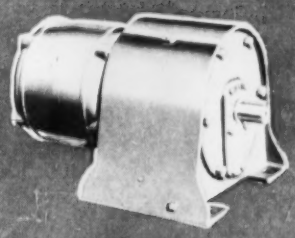
many types, sizes, styles, arrangements...

ALL-STEEL FALK Motoreducers

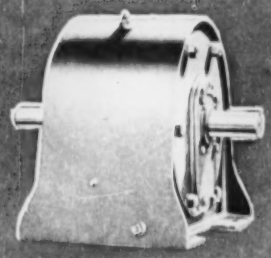
cover the entire application range



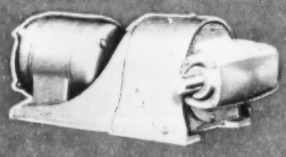
Type EZ, All-Motor Horizontal Motoreducer. Accommodates any make or type of foot-mounted motor.



Type EF, Integral Horizontal Motoreducer. Standard NEMA D-flange motor mounts directly on Motoreducer housing.

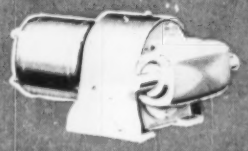


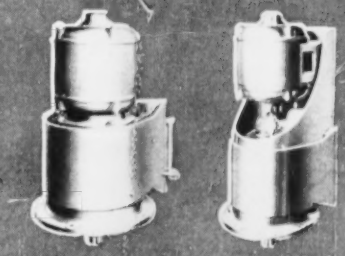
Type EC, Concentric Shaft Speed Reducer. Coupling, chain or belt driven.



Type EBZ, All-Motor Right Angle Motoreducer. Any output shaft position (see below, right).

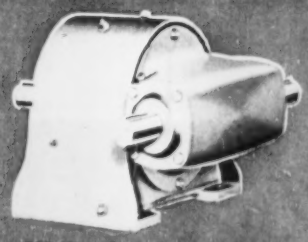
Type EBF, Integral Right Angle Motoreducer. Employs NEMA D-flange motor.





Type EFX, Integral Vertical Motoreducer. Employs NEMA D-flange motor.

Type EZX, All-Motor Concentric Motoreducer. For vertical applications.



Type ECB, Right Angle Speed Reducer. Any output shaft position; coupling, chain or belt driven.

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The name FALK on a reducing unit of any size or type is your positive guarantee of highest quality, value and efficient performance with minimum maintenance throughout its long life.

All-steel FALK Motoreducers—both the All-Motor and Integral types—are available in horizontal and vertical models with double, triple or quadruple reduction; concentric and right-angle shaft arrangements. They cover a surprisingly wide range in horsepowers and in output speeds. Every FALK Motoreducer is built and rated according to AGMA standards.

Whatever your reduction requirements—be they simple, complex or "different"—it is just good business to consult FALK, recognized leader in the Motoreducer and speed reducer field. Write to Department 247.

Every FALK Motoreducer has these "IN-BUILT" Factors

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

Precision Gearing. Heat-treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

Sealed Housings. Dual closures and one-way vents keep oil in, dust and moisture out. Units are splashproof, leakproof, dustproof.

Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

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Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

Any Output Shaft Arrangement (on Right Angle models). Shafts can be furnished in horizontal, vertical or angle position as shown in sketch at right.

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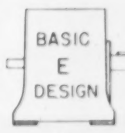
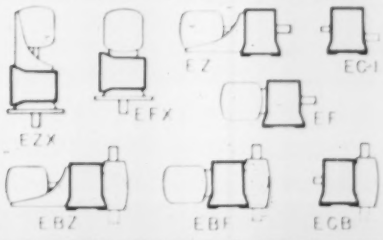


EC

The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.



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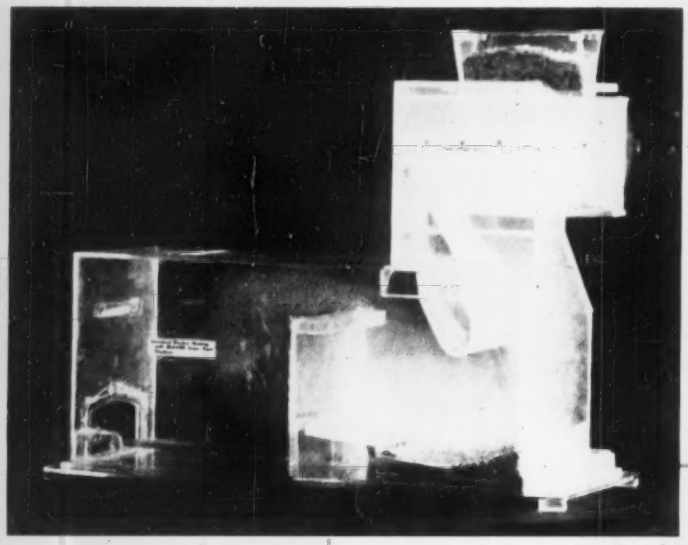
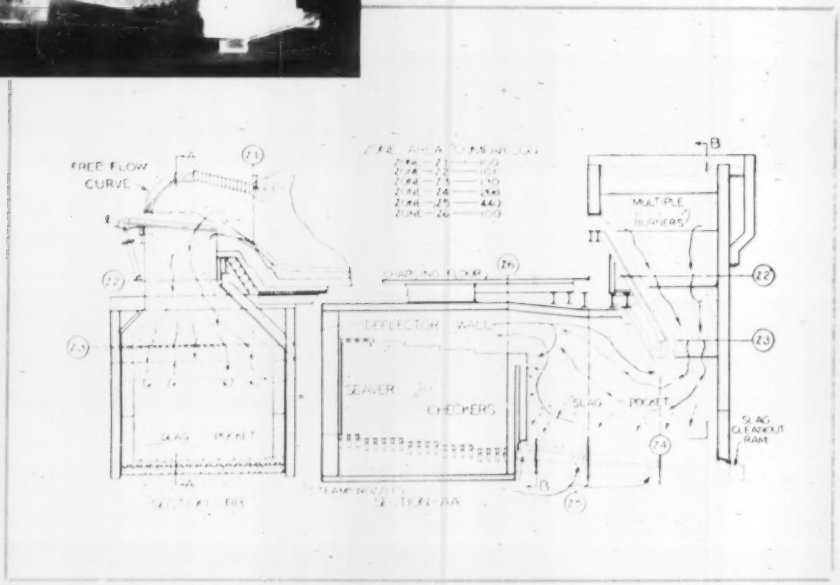
THE FALK CORPORATION, 3001 W. Canal St., Milwaukee 8, Wis.

WRITE TO DEPARTMENT 247



Model of refractory deflectors and stepped slag pocket bottom. Atmosphere depicts flow of gases in downtake, slag pocket and checker chamber



End view (left) and cross section of an open hearth showing location of refractory deflectors and the stepped slag pocket bottom with the continuous cleanout

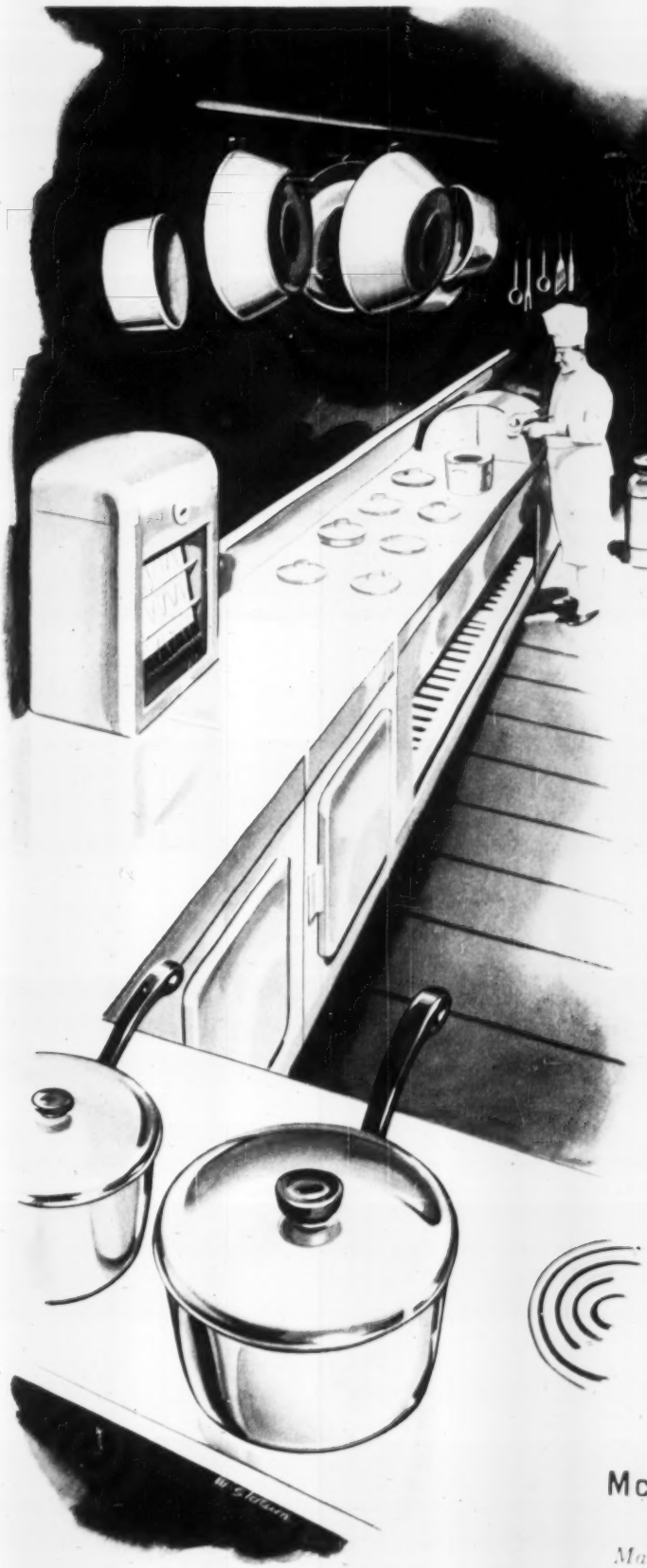
TABOOS Slag Pocket Build-Up

Reflectors in open-hearth slag pockets free gas of entrained solids and eliminate need for lancing of checker system. Design could be the aspirin for steelmaking headache

SLAG removal from open-hearth slag pockets is a time-consuming and costly operation, and operators are always on the alert for ways and means of clearing debris from this area. The average quality of slag and other deposits which accumulate in a slag pocket, is about 240 tons and the average time involved in removing these is about nine 8-hour turns with a 10-man crew per turn.

A system recently devised by the Jay J. Seaver Engineers, Chicago, greatly simplifies slag removal from open-hearth slag pockets and gives a clean wide ribbon of gas the full width of the regenerator chambers.

Deflector — The downtake is equipped with a refractory deflec-



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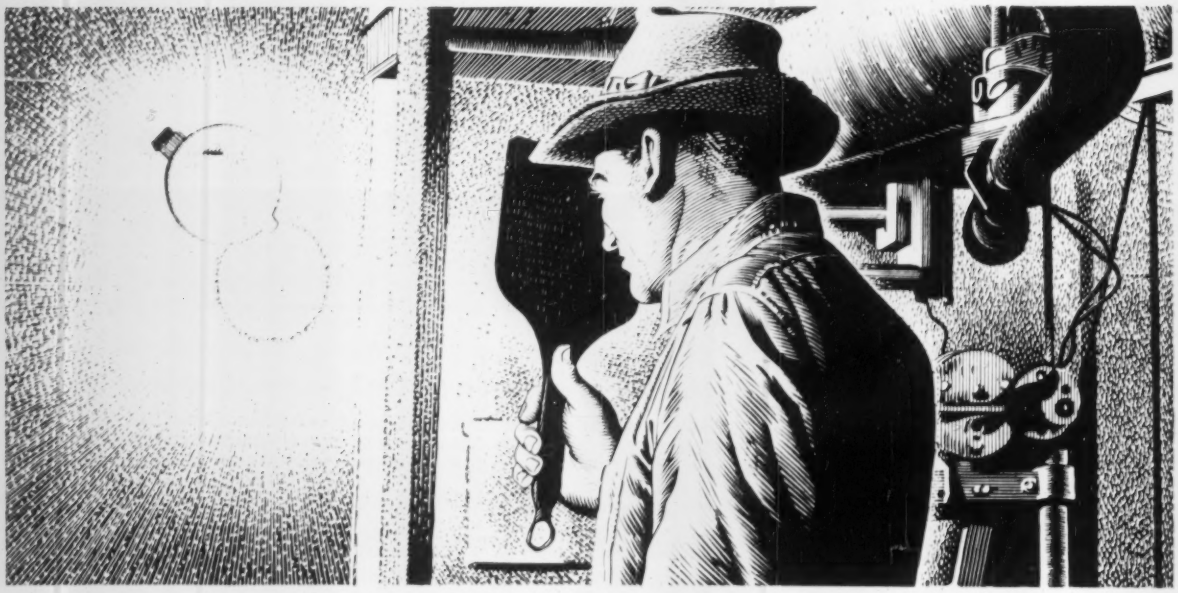


YOU CAN'T SEE WASTE HEAT!

CONTROL OF EXCESS AIR BY CITIES SERVICE HEAT PROVER CAN REDUCE HEAT LOSSES AT CEMENT PLANTS! In cement kilns, air must be controlled to the precise quantity that will just completely burn the fuel. Any excess of air above this amount carries waste heat out of the kiln. THE HEAT PROVER ENABLES THE OPERATOR TO SEE WHEN THE RIGHT AMOUNT OF AIR IS ENTERING THE KILN.

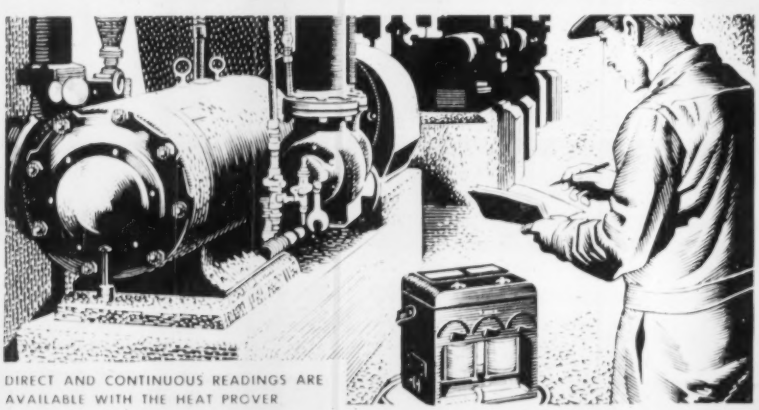
Many air-measuring methods allow only intermittent sampling of kiln gases. With the Heat Prover, direct and continuous readings of kiln combustion are available for immediate use . . . and the Heat Prover can bring about a considerable fuel savings and can substantially increase just about any cement plant's operating efficiency.

WHEREVER A FURNACE OPERATION IS INVOLVED the Heat Prover can help increase productivity and decrease operating costs. It samples rapidly and provides simultaneous and continuous readings of oxygen and combustible gases. The Heat Prover is portable — a technically accurate combustion analysis is obtained in a usable, practical manner. For details call your nearest Cities Service Office or write Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.

BUT THE CITIES SERVICE HEAT PROVER CAN!

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



DIRECT AND CONTINUOUS READINGS ARE AVAILABLE WITH THE HEAT PROVER

tor which directs the gas flow to the bottom of the slag pocket, as shown in the accompanying illustrations. A decrease in the velocity of the gas causes entrained matter to be released and fall to the bottom of the pocket. Steam jets serving this particular section blow the deposits beneath the furnace endwall into a separate compartment where a cleanout ram moves the solids to the outside continuously.

Meanwhile, the gas has assumed a wide free-flow curve and before leaving the pocket comes in contact with a deflector wall.

Two Things Occur — First, any entrained matter not already released from the gas is intercepted and made to drop to the uppermost section of the stepped bottom. From there it is removed by the steam jets which force it into cleanout compartment.

Second, the deflector wall causes the gas to be deflected up in a curve and come down vertically over the checker area so as to make the entire column of checkers effective.

This improved design affords a decrease in tap-to-tap time, an increase in heat recovery, improved combustion and the elimination of checker lancing.

Orthopedic Sock

Ingenious use of an orthopedic sock has solved a major problem in operating new soaking pits installed at Crucible Steel Co. of America's Midland Works, for heating ingots. Speaking at the annual conference of the Pittsburgh Section, Instrument Society of America, Arnold Robbins, Midland combustion engineer, explained that in initial operation, temperature measuring elements for the new pits had started to read 100 to 200 F low.

Immediate investigation showed that the lens of the temperature-sensing elements had collected a coat of oil film, dust and other atmospheric impurities causing imperfect response to temperature measurement. A filter, first of cheesecloth, now refined to material from an orthopedic sock, has eliminated clouding of the important lens and permits perfect operation of temperature control instruments.

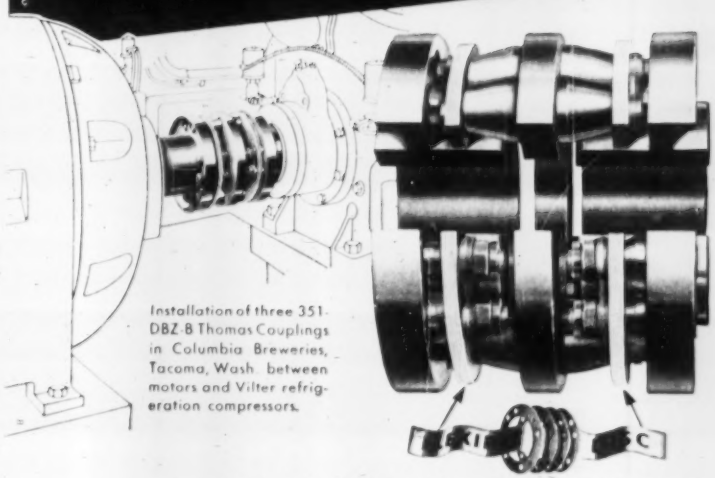
Noncritical Alloy

Naval Ordnance Laboratory has announced development of Thermenol, a high-temperature alloy of noncritical metals, showing promise of doing the work of certain stainless steels.

Thermenol is a modification of the magnetic material 16-Alfenol, which was developed in the laboratory's Magnetics Division as a noncritical soft magnetic material. Metallurgists working in the laboratory found that by making small additions of such metals as vanadium or molybdenum, coupled with suitable heat treatment, heat resistance of the alloy was increased and a new group of heat resistant alloys resulted.

Thermenol is a member of this family. It is 20 to 25 per cent lighter than stainless steel and its physical characteristics include a high tensile strength coupled with a high resistance to corrosion or oxidation. Laboratory tests point to suitability of material for use in such items as jet engines.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



Installation of three 351-DBZ-8 Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating
NO LUBRICATION	No Wearing Parts. Freedom from Shut downs
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained

THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.

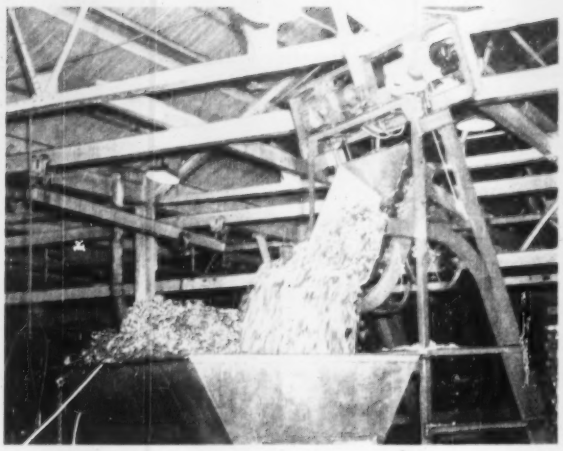
Write for our new Engineering Catalog No. 51A

THOMAS

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

WASTE HANDLING Is Turned To *Profits* . . .

Eaton Mfg. made capital expenditure of $79,000 for chip handling equipment and oil reclamation system. Gross savings trebled that amount in only 20 months



Long oil-saturated turnings are raised by skip hoist from this collection area and contents dumped into a larger-capacity chip buggy for transfer to chip room

AN AMAZING savings record has been compiled by Eaton Mfg. Co., Cleveland, with its improved waste and oil disposal and reclamation program. The original expenditure amounted to $79,000 which included oil and chip handling equipment, excavations for underground tanks and miscellaneous costs. In the first 20 months of operation, Eaton realized gross savings totaling $235,667.

Even more amazing is that the entire cost of the new equipment plus installation was written off in the first nine months. And maintenance costs of the over-all installation in 1952 amounted to only 17 cents per net ton of chips shipped, which totaled 26,146,360 pounds. This maintenance cost figure is even more remarkable when it is considered that the material handled is extremely abrasive.

Program Is New — Formerly, there was no planned, effective, waste reclamation program. Various individual foremen and department heads had tried to do an effective reclamation job within their own departments. There was, however, no co-ordinated program on a company-wide basis.

Waste was dumped and sold. Most cutting oil was lost since it clung to the chips, turnings, etc., that were hauled away by private contractors. Those oils, however, which clung to the short turnings and which could be centrifuged, were reclaimed.

Chips, turnings and borings were collected in chip barrows and moved to two piles in the yard. This waste was collected daily by outside firms. A great deal of manual effort was involved; excessive numbers of manhours were required to do the job. Men had to go out-of-doors to dispose of the waste, creating a health hazard. Men were frequently sick with colds and flu because of the outside work in all sorts of weather.

How It Works—Dry and soluble oil chips are collected and transported by chip barrows to an under-the-floor hopper in Building 1. Moves average only 275 feet. The chips are dumped into the hopper through a floor grating, are picked up by a six-inch enclosed flight conveyor which elevates them to the penthouse of an adjoining building where, through one of three chutes, the material is shunted into waiting gondola cars. There is no processing performed on these chips; hence they bypass the crushing room located in Building 2 directly under the penthouse.

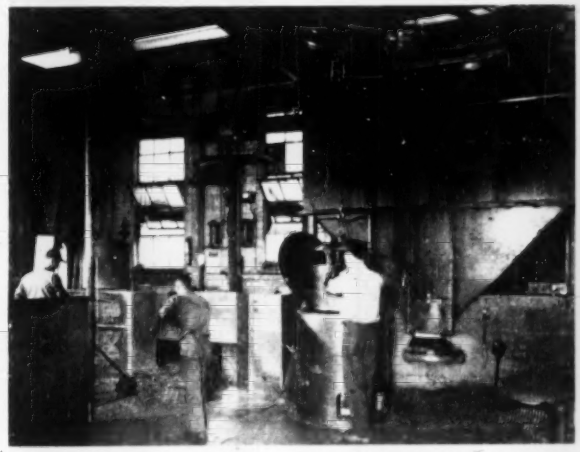
Dry and soluble oil short turnings are generated in Building 2, moved by chip barrow and dumped through a grate at the extreme right side of the crushing room. Since such turnings do not require crushing or centrifuging (soluble oil is not reclaimed), they are picked up immediately by a five-inch flight conveyor and raised to penthouse, thence fed to rail cars.

Oil Reclamation — Short oily chips are collected from Building 1, moved to the crushing room and dumped through a floor hopper at the extreme left of the room. Here they are picked up by a four-inch flight conveyor which elevates, then discharges them into a large storage hopper which rises to the ceiling of the crushing room.

For centrifuging, an operator sets a bucket on the floor below the hopper gate; this gate is opened by an air-operated control valve, allowing the chips to flow into the bucket. The full container is raised by one of two hoists and deposited into a centrifugal spinner where the oil is extracted; the spent chips are then dumped through the floor grate, are picked up by the five-inch conveyor, and raised to the penthouse, thence distributed to the rail cars.

Long Turnings Too—Oil saturated long turnings are collected in chip barrows and transported to one central collection point in Building 1. This area is located nearest to those points generating the majority of this type of material. Because of the volume and weight of these turnings, the barrows are raised by skip hoist and the contents dumped into chip buggies, which are moved to the crushing area by industrial truck.

Upon arrival, they are fed to the crusher, thence to the five-inch conveyor. Instead of being carried to the penthouse, a small gate



Crushing room is key to system. Dry and soluble types move either directly or through crusher to cars; oil-saturated types through centrifuge, then to rail cars

Loading of outgoing scrap is accomplished easily through chutes leading from one of the three conveyor gates. Arrangement of the chutes allows loading without switching

in the conveyor tube is opened and the chips fall through a trough into an opening in the four-inch conveyor which transports them to the storage hopper. From this point on, the procedure is identical to that enumerated for short oily chips, with the load eventually being raised to the penthouse and finally shunted into the waiting rail cars.

Another Type—Still a fifth type of scrap is soluble oil long turnings which are generated in Building No. 1. These are loaded in chip buggies which are spotted along side the under-the-floor hopper which receives the dry and soluble oil chips. When full, the buggies are hauled by industrial truck to the crushing room.

Here, the material is fed directly to the crusher, is picked up by five-inch conveyors, and sent on its way to the rail cars. At the present rate of production, we are loading better than one gondola car per day. In one year, a total of 26,146,360 pounds was handled in the system, although actually the conveyors transport material only 50 per cent of the time.

Cutting Oils Surveyed—At the same time the new waste reclamation program was under survey, a thorough study was made into the handling and reclaiming of cutting oils and the handling of soluble oils. This was deemed advisable because of the close connection between the two operations.

In 1950, the present system was installed as part of the over-all modernization program. Now, paraffin, sulphurized, and soluble oil is purchased at less cost in bulk highway truck, is transferred to underground storage tanks in yard.

As required, cutting oil is pumped from tanks to proportioners and homogenizers located in the basement of the crushing room. It is then piped to various stations throughout the plant in the exact mixtures required for specific operations. Thus, precise mixtures are always available. In some areas, the outlet for the cutting oils serves several small machines which are grouped together, in other cases oil is piped directly to single machines.

Oil Loss Down—As stated earlier, under the old system, oil was reclaimed only from some short turnings. All other oil was lost.

Now, reclaimed and cutting oil, obtained when chips are centrifuged, flows into an underground storage tank in the yard. It is then pumped to an oil purifier and again returned to another underground storage tank as clean, reclaimed oil. As needed, the oil is pumped to the proportioners where it is blended with sufficient new oil to bring it up to Eaton standards. Then it goes back into the system. Everything is precisely controlled at all times.

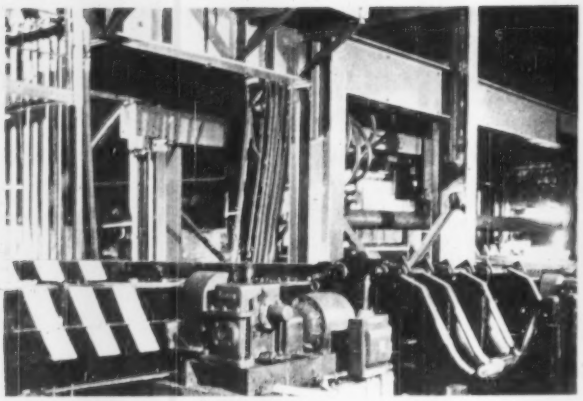
On the average, 80 per cent of all cutting oil is now reclaimed. Drum handling is minimized, there is no physical effort, no confusion or congestion, and most important, exact mixtures at machines prevent damage to the cutting tools.

TOTALS AFTER 20 MONTHS OPERATION

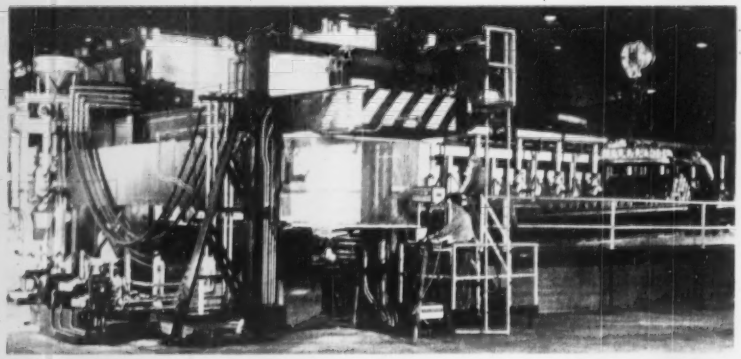
GROSS SAVINGS	
A. Higher Sales Value of Crushed turnings	$110,416
B. Value Of Reclaimed Cutting Oil	53,491
C. Differential in Price Of Oil (Bulk vs. Drums)	23,991
D. Estimated Oil Returned in Drums (A Certain Percentage of Oil Cannot Be Emptied)	2,236
E. Savings in Labor Resulting From Over-all Installation—Wages	45,533
TOTAL SAVINGS	$235,667

COSTS	
A. Total Costs Including Capital Investment Plus Maintenance for 20 Months, Labor and Material for 20 Months	$ 84,370
TOTAL GROSS SAVINGS (20-Month Period)	235,667
TOTAL COSTS (20-Month Period)	84,370
NET SAVINGS	$151,297

Tunnel-Type Furnace Shows Safety-First Hydraulics



Manual discharge machine, just as the automatic charger, employs tong-type equipment actuated by 650-psi hydraulic system powered by a 15-hp motor. Last of the three heating zones is capable of bringing billets to a maximum temperature of 2300° before going to piercing mill



Above is inlet charger and charging table of Timken's tunnel-type furnace, said to be the first of its kind in the U. S. steel industry. TV camera permits operator to view automatic charging by closed circuit. Complicated hydraulic system uses fire-resistant hydraulic fluid

Strong points of Timken's new furnace go further than production advantages. The installation incorporates safety in its hydraulic system with a new fire-resistant fluid

AN OUT-OF-SIGHT innovation — fire-resistant fluid in the hydraulic systems — is only one plus feature of the tunnel-type furnace that began operating recently at Timken Roller Bearing Co.'s Canton mill.

The company expects fuel efficiency and semi-automatic nature of its new unit to achieve lower cost, greater throughput and better quality than the furnace it replaced.

Greater Safety — Sensitive to methods and materials that can increase safety, Timken began to use fire-resistant fluid in straddle trucks about a year ago. The fluid is Monsanto Chemical Co.'s Pydraul F-9, employed first on the handling equipment and now in the furnace mechanism.

Billets are carried through the furnace on cars 12 feet wide and 11 feet, 9 inches long in 45 minutes to 1 hour and 40 minutes. Time depends on billet size and desired space between billets. Both the 200 and 800-psi systems draw from a 1000-gallon hydraulic fluid reservoir. The 200-psi system is powered by a 40-hp pump which operates the hydraulic lifts and car separator; the 800-psi system is supplied by a 15-hp pump that operates the under car puller.

Each charging and discharging machine has a 100-gallon, 650-psi hydraulic system powered by 15-hp motors. In addition, a 50-gallon system operates the automatic fuel-air ratio controls, one for each of three heat zones, plus the automatic furnace pressure control which regulates the stock damper.

Control of Conditions—From automatic charging machine, controlled by movement of the hearth, to manually-operated discharging machine, the integrated units make possible nearly ideal control of conditions to meet job requirements. Thirty-four gas fired burners, with oil as a standby fuel, produce the heating zones which billets pass through as they are brought up to a maximum temperature—2300 F, if necessary.

A discharged car is pulled onto an exit lift by the car separator and lowered beneath the furnace. There a dolly returns it to the charging end in 40 seconds. The cycle is completed when the car is raised to the furnace level at charging end on a hydraulic lift.

Furnace capacity is 50 tons per hour. Its cost was about $500,000.

Which is the CleCap?

...the outsize one that nobody else makes

One of the advantages CleCap customers enjoy is the knowledge that when they want some of those BIG cap screws, the chances are 9 out of 10 we can ship them the same day.

CleCap makes 'em from ¼" to 2½" diameters, any length you want—ferrous and non-ferrous—and we stock a lot of unusual sizes, nearly 10,000 different items last count.

That's another reason for dealing with *The* cap screw specialists of the country. You also get unbeatable top-quality fasteners . . . PLUS a CleCap crew that has a long-made rep for "busting a leg" to get you what you want exactly when you want it.

What happens to your profits when late deliveries hold up production lines? Put your cap screw needs up to CleCap . . . and relax!

The Cleveland Cap Screw Co.

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CLEVELAND *Top Quality* **FASTENERS**

Ferrous and Non-Ferrous

Hex Head Cap Screws—Bright and High Carbon Heat Treated Steel, Brass, Silicon Bronze, Stainless Steel; ¼" to 2½" dia.

Socket Head Cap and Set Screws—Plain and Knurled ¼" to 1½" dia. Also Flat and Button Head Styles.

Flat Head Cap Screws: ¼" to 1" dia.

Fillister Head: ¼" to 1¼" dia.

Set Screws—Square Head: ¼" to 1½" dia.

Milled Studs: ¼" to 1¼" dia.

Place Bolts: ¼" to 1½".

Structural Bolts to ASTM Specification A 325

Tractor Bolts

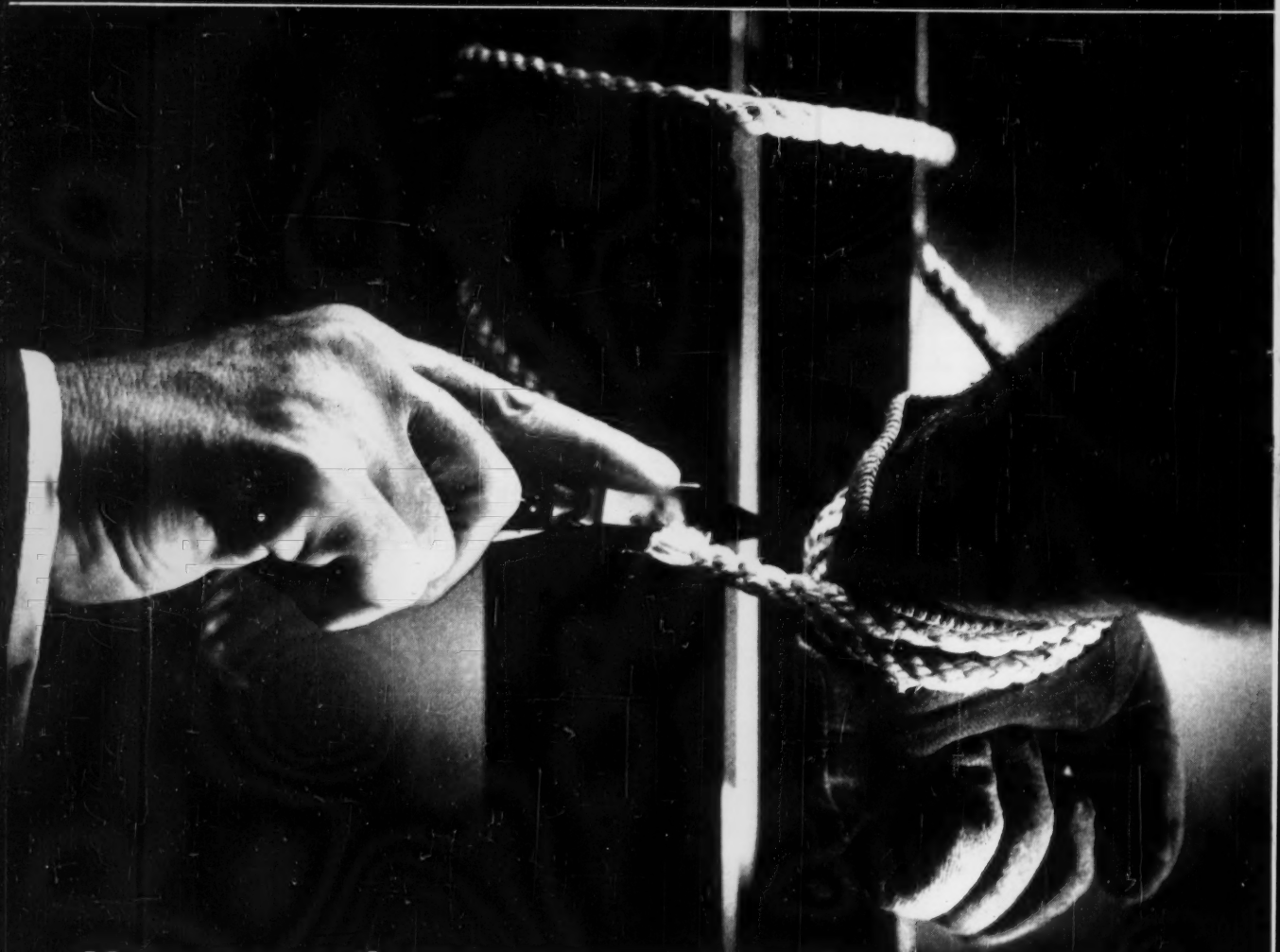
Special Hot and Cold Headed Parts

Facilities to make larger diameters than listed.

Ask Your Jobber for CleCap!

Originators of the Kaufman DOUBLE DIE-SION Process

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



You can release manpower for other jobs!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

MOVING steel into your storage area and then moving it out again when it is needed at the production line or job site requires manpower and time. You can reduce these costs by letting U. S. Steel Supply deliver your steel where, when and as it is needed. Complete stocks and fifteen warehouses assure prompt deliveries of your steel.

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UNITED STATES STEEL

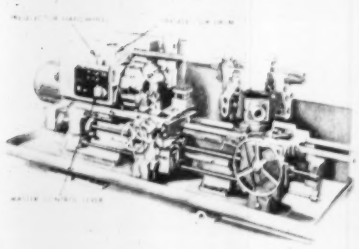
NEW PRODUCTS and equipment

Reply card on page 131 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Turret Lathe

. . . with greater power

The 3A turret lathe is designed for greater power to permit users to take full advantage of tooling, cutter design and cutter materials. The 3A is the first of four new heavy-duty saddle-type models.



It is available with 4½ or 6-inch round bar capacity. Effective swing is 23½ inches. The 4½-inch capacity spindle has an 11-inch American Standard flanged nose; the 6-inch capacity has a 15-inch American Standard flanged nose.

Among new features are: Four speeds added to give a range of 35½ to 1; the headstock has disc type hydraulic clutches for forward, reverse and brake action; shifting of gears is done hydraulically and automatically; head end gear boxes have been redesigned to incorporate antifriction bearings with automatic oil supply. Warner & Swasey Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Phosphatizing Process

. . . used with silicone paints

You can phosphatize steel and still apply silicone finishes. The new process is built around Diversey Divobond.

In addition to its use with silicone paints, it is expected that Divobond will find general application as a one-shot cleaning, rustproofing and paint-adhering process. It is claimed to operate over a wider pH range and is thus far less critical in use. Samples and test panels are available to those interested. Diversey Corp.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Space Heater

. . . gas fired, warm air

Addition of two gas-fired warm air space heaters to supplement its line of Paraflo oil-fired heaters is announced by Dravo's Heating Department. Known as model 20-G with a capacity of 200,000 Btu per hour and 25-G with a capacity of 250,000 Btu per hour,

the new units are suitable for natural, manufactured or mixed gases and liquefied petroleum.

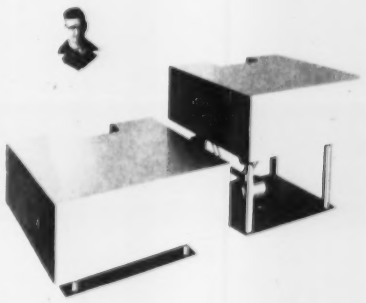
The self-contained, gun type, flange mounted gas burner incorporates a combustion air fan driven by a ¼-hp resilient mounted motor. It operates on 110 volt, 60 cycle, single phase power and is equipped with a thermoelectric safety pilot. Dravo Corp.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Pack Lifters

. . . push button controlled

Feeding and receiving Portelvator Pack Lifters maintain materials at constant, predetermined



levels for convenient feeding of machines.

They are designed for pit installation. Lift load capacity is 2200 pounds. Rise is 16 inches from floor level at a speed of 27.5 inches per minute. Operated by a ¾-hp motor with reversing magnetic starter, pushbutton controlled, each machine is equipped with a gear driven limit switch. Hamilton Tool Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Portable Pyrometer

. . . for precision measurement

An optical pyrometer designed for precision temperature measurement in the laboratory is sufficiently portable to be used for general plant applications. The Pyro Micro-Optical unit has been developed

to obtain a high degree of accuracy, plus versatility in measurement of temperatures over 700° C.

It is capable of measuring targets less than 0.001 inch in diameter. By means of supplementary

lenses it can be adjusted for focal distances varying from 5 inches to infinity. Pyrometer Instrument Co. Inc.

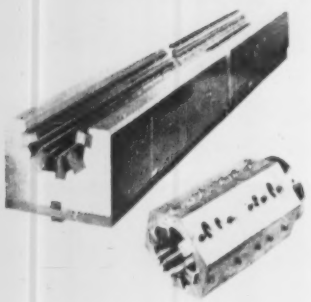
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Steel Broaches

. . . finish external surfaces

Line of broaches for finishing external surfaces on circular metal parts is made in a wide variety of sizes, in two general types: External surface and internal.

External surface broaches consist of a steel main broach holder



and steel sub-holders that support the high speed steel broach section inserts. Broach main holder is keyed to a sub-base, which in turn is keyed to the ram. Internal broaches also have a steel broach holder into which steel sub-holders supporting high speed steel broach sections are bolted. Holder includes a pilot at the base for positive location on the table in relation to the press piston rod. National Broach & Machine Co.

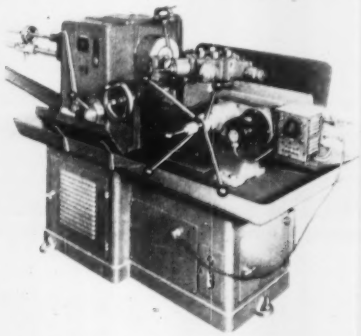
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Turret Lathe Power Feed

. . . rates from 1.40 to 20 ipm

A new electric power feed for Oster's Rapiduction turret lathe consists of a 1/15-hp, 1750-rpm motor which drives the carriage rack pinion through a spur gear reduction, consisting of alloy steel gears, flame hardened.

A small transformer mounted in the control compartment of the machine provides 110-v ac current to the rectifier and control unit. Rectifier converts the current to dc and a variac varies armature voltage to the motor. A limit switch automatically cuts out carriage feed when carriage is 1/16-inch away from a positive stop.



Rates of feed to turret carriage from 1.40 to 20 ipm are obtainable through various feed control settings. Oster Mfg. Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Lift Magnet

. . . battery operated

A lift magnet manufactured by Sundstrand is powered by a common 6-v automobile battery and can lift 2000 pounds of finished

mild steel. The operator has only to turn the switch, eliminating cumbersome chain or rope hitches and eyebolts.

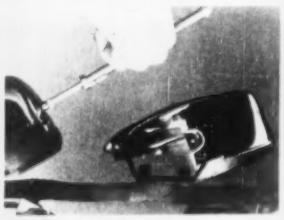
There are no attached cords or wires to restrict length of haul. A 4-amp battery charger can be plugged into any 110-v electrical outlet. Magnetizing surface is 7 x 12½-inches and height of the entire unit is 12½ inches. Sundstrand Magnetic Products Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Thickness Tester

. . . a magnetic instrument

Thickness tester, called the Pocket Handi-Gage, will test thickness of electroplated cadmium, cop-



per, brass, silver, zinc, tin, lead, nickel, zinc-tin and lead-tin alloys on steel, as well as hot-dipped tin and zinc.

When the magnetic end of the gage is applied vertically to the surface to be tested and slowly pulled away, calibrated inner stem appears. The distance the stem travels before the magnet releases itself from the surface is a measure of the coating thickness. Platers Research Corp.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Air Hose

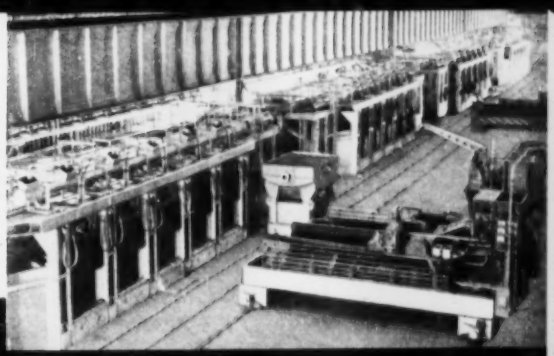
. . . for 400 pounds pressure

A heavy-duty air hose developed by B. F. Goodrich is recommended

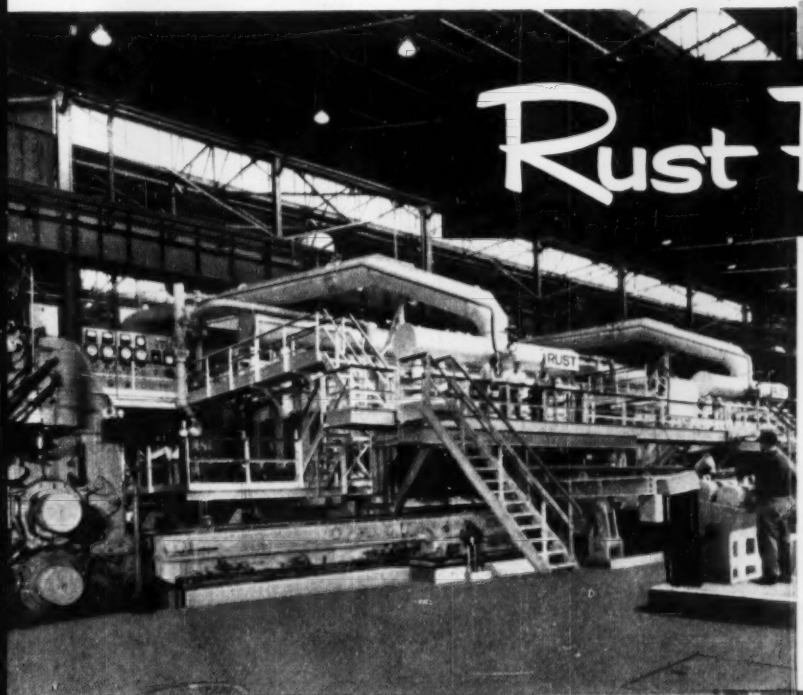
for 100 pounds working pressure.

The hose is designed for rugged service in general industrial use

for every metallurgical heating need ...



Rust Furnaces



Whatever your needs in melting, reheating or heat treating, there's a type of Rust Furnace to do your job efficiently and economically.

Automatic . . . all fuels . . . easy to operate . . . trouble free. Hundreds of installations, ranging from small to extremely large, attest to Rust's world wide leadership in furnace design and construction.

- OPEN HEARTH FURNACES
- RECUPERATIVE SOAKING PITS
- REGENERATIVE SOAKING PITS
- SINGLE, DOUBLE, TRIPLE-FIRED CONTINUOUS REHEATING FURNACES
- CAR TYPE HEAT TREATING FURNACES
- BOX ANNEALING FURNACES
- CONTINUOUS PIPE ANNEALING
- CONTINUOUS STRIP ANNEALING
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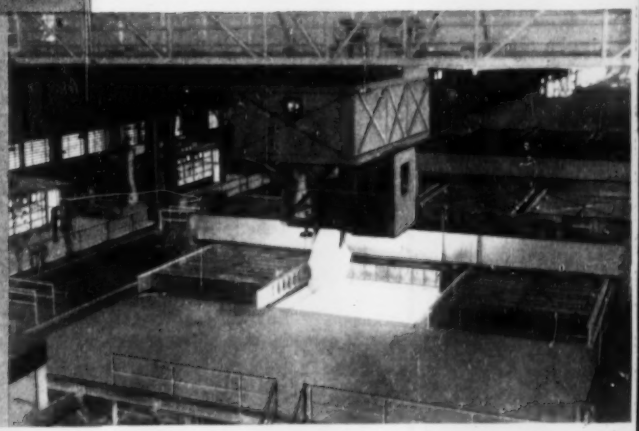
- ORE THAWING, SMELTING, AND OTHER
- SPECIAL FURNACES FOR MANY USES



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One contract covers everything, from original idea to start-up. Rust assumes responsibility for design, manufacture, erection and initial operation. Rust is prepared to undertake these different phases of the work with its own forces. This results in substantial savings to customers, because of only one overhead and profit, instead of the "pyramiding" which occurs when several contractors are used.

24 Pages of furnace Information

Write for your copy

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Rust Furnace Company

Pioneers in Furnace Design

Rust Building • Pittsburgh, Pa.

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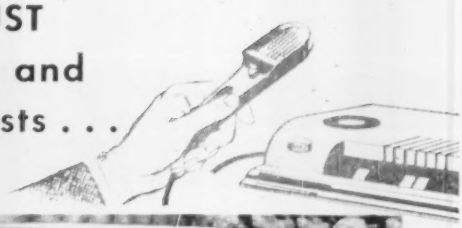
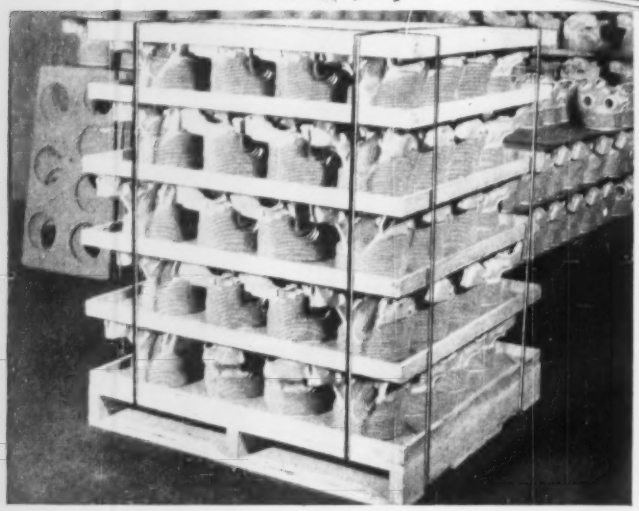
cut packing and
shipping costs . . .





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will "UNI-TIE" your product
to save time, space, man-power
. . . and MONEY

The end of the production line isn't where cost-cutting ends. Stack your goods on skids or pallets and "Uni-tie" with STANLEY Steel Strapping. You'll substitute piece-by-piece handling for a compact load that one man can move quickly, store in a minimum of space in warehouse or freight car, and load or unload easily and rapidly. You'll reduce materials handling damage, give your product positive protection . . . and cut costs all along the line. In your case, as in the illustration above, "Uni-tieing" may eliminate costly individual containers.

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NEW PRODUCTS and equipment

where high working pressures are required or where the hose cover is subjected to severe abrasion. Flexible, the hose is reinforced with a single braid of high tensile steel wire. An oil-resistant hose tube permits tools to be oiled through the hose. B. F. Goodrich Co.

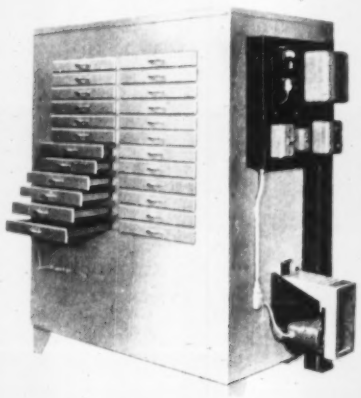
FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Cabinet Drawer Oven

. . . adjustable exhaust, intake

Model HBD oven is especially adapted to preheating and stress relief of small parts for processing nylon powders and other processing up to 850 F.

Special drawer construction which closes opening in cabinet when the drawer is pulled out permits insertion or removal of contents of one drawer while keeping



temperature at maximum required in remainder of oven. Other features: Uniform work chamber temperature; high volume adjustable air flow; high and low heat switch for close control and quick recovery; inconel-sheathed lifetime heating elements. Grieve-Hendry Co. Inc.

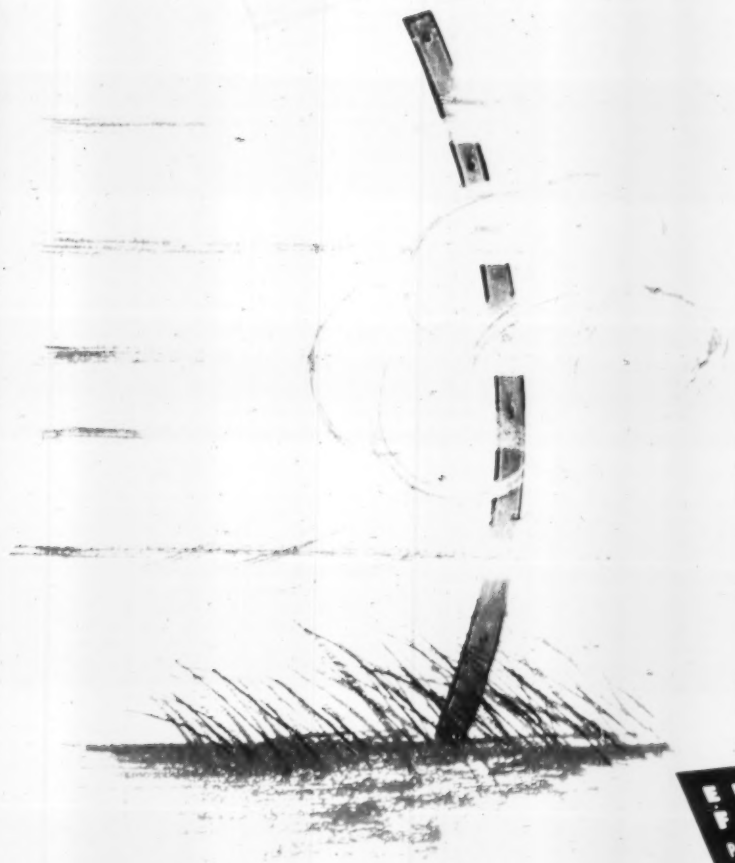
FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Wheel Bearings

. . . handle front wheel load

Two new tapered roller bearings are engineered to handle front-wheel loads of 80 per cent of new automobiles equipped with tapered roller bearings. Inner front wheel bearing has an outside diameter of 2.328 and con-

END SPEED LIMIT



GET ALL THE OUTPUT THAT'S BUILT INTO YOUR MACHINES...USE

ANTISEP

You can easily prove that Antisep heavy-duty cutting fluid keeps up with the speed of your modern equipment . . . just try it!

Today's machines and modern tooling are made to give you increased metal-cutting capacity and more profitable operation.

So is Antisep . . . the heavy-duty water-soluble base that lubricates better and takes heat away faster than any cutting oil you can match against it. It has excellent anti-welding properties as well—and no objectionable odor.

Take the speed limit off your machines by using Antisep. Call the Houghton Man . . . or write to E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa. . . . for a trial production run.

NO SPEED LIMIT HERE!

An Ohio manufacturer increased production substantially by changing to Antisep, machining collets of Hy-Ten steel (M temper) at 85 SFM—which was considerably higher than the speed he formerly regarded as top—and obtained improved finish as well.

ANTISEP

THE HEAVY-DUTY, WATER-SOLUBLE

CUTTING BASE

. . . a product of

E. F. HOUGHTON & CO.

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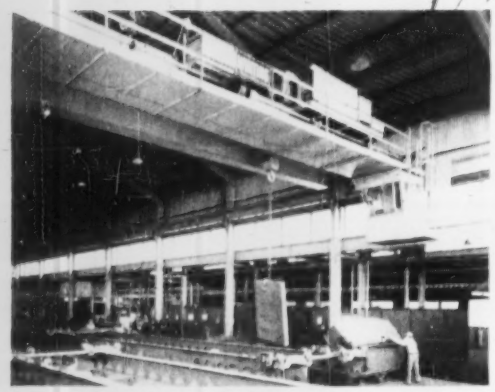
Ready to give you on-the-job service . . .

at his fingertips...

WHITING
Engineered
OVERHEAD CRANES

positive control for all load movements

High up in his cab, the operator of a Whiting Traveling Crane guides his brawny, powerful giant just by moving his fingertips. Whiting Magnetic Controls give the operator positive and precise control of all movements, making it easy to lift, move and "spot" each load quickly and accurately. Improved crane operation like this increases the productivity of the whole plant . . . and that's why Whiting Cranes are selected to handle the *big jobs*—loads up to 450 tons. In industry after industry, Whiting's engineering skill and 70 years of experience show the way to solve important handling problems. Write for complete facts, today!



Operator has unobstructed view of the plant floor and the hoist. Whiting's Full Vision Cab and compact Magnetic Controls make this possible.

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15643 Lathrop Avenue, Harvey, Illinois
Sales Offices and Distributors In All Principal Cities

Whiting Serves All Industry

Electric Chain Hoists

The Whiting Trackmobile

Trambeam Overhead Handling Systems

Whiting Corporation also manufactures Railroad, Foundry and Aviation Equipment, Swenson Equipment for the Chemical Process Industries and Metal Working Machinery.

tains 19 rollers. Outside bearing measures 0.157 less OD than its predecessor and contains 14 rollers. Lighter bearings, hubs and

spindles mean less unsprung weight.

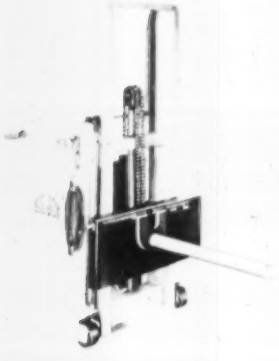
New bearings also take up less space in the wheel assembly. Material therefore can be saved on spindle and hub, and machining time on these parts will be reduced. Timken Roller Bearing Co.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Lift Truck

. . . less machine weight

A light, battery-operated, hand-propelled hydraulic fork lift truck that can handle double faced pallets, wire coils, tote pans, rolls, dies, jigs, carboys has been developed by Big Joe. It is designed



with one of the lightest counterweights ever applied to a 1000-pound lift truck.

Because of its unusually light weight it can be used in small areas difficult for mechanized equipment. Adjustable forks increase its versatility. For lifting cylindrical items, a ram attachment is interchanged. Big Joe Mfg. Co.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Metal Cleaner

. . . cleans without foaming

Oakite Composition No. 161 is inhibited to provide maximum safety to aluminum. Due to its built-in antifoam properties, this material is also effective in high-pressure spray washing machines for cleaning steel and other metals.

It is recommended for all pressure washing machine applications in the concentration of ½ to 2 ounces per gallon, at temperatures ranging from 160 to 185 F. It is simply added to warm water, then heated to operating temperatures. Oakite Products Inc.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Shock Absorbers

. . . for portable grinders

Vibration Dampeners are simple and effective, yet eliminate shock and jars of grinding and improve quality of finished surface.

For example, they actually permit full-face application of abrasive

discs to the work. Resulting disc motion is slightly oscillatory, which gives a lapping action and a smoother, scratch-free surface. J & H Products Co.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Rust Preventive

. . . compatible with oils

A rust preventive, Gulf Oilcoat T, is a compounded oil with non-metallic high potency additive to prevent corrosion and rust of metal surfaces. It is especially applicable for protection of machinery during shipment, storage or seasonal shut-down.

In addition to its rust protection properties, most outstanding characteristic is compatibility with machine lubricating oils. This is particularly important if the lubricating system is flushed with the same oil that is to be used for lubrication. It can effectively be applied to metal surfaces by spray, dip or brush. Gulf Oil Corp.

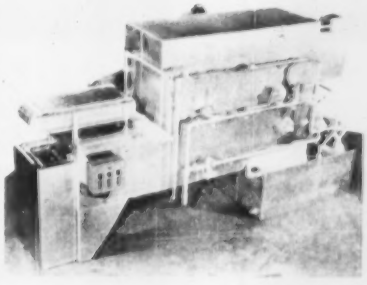
FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Hardening Furnace

. . . with 150 pound capacity

A semi-continuous clean hardening furnace having a productive capacity of 150 pounds per hour is announced by Industrial Heating Equipment.

The CA-150 furnace is arranged as a package unit. It is radiant



tube gas fired and includes a built-in generator, quench tank, loading conveyor and a quench tank conveyor. The loading and furnace conveyors are integrally driven and a separate drive is provided for the quench tank conveyor. Overall dimensions are 16 feet 6 inches long by 5 feet 10 inches wide by 7 feet 5 inches high. A working area of 5 feet long by 1 foot 6 inches wide is provided on the conveyor belt. It operates on a 110-v current. Industrial Heating Equipment Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

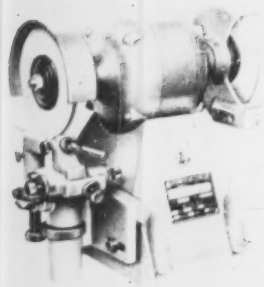
Drill Point Grinder

. . . fast, accurate

Crankshaft drill point grinder provides a fast accurate method of grinding crankshaft points on drills ranging from No. 1 through No. 50, A through U and 3/64 through ⅜-inch.

In operation, the drill is rocked into the wheel to grind one notch, returned, indexed 180 degrees and the operation repeated for the other notch. An adjustable diamond truing device trues the wheel

with one quick motion. A tilting fixture is adjustable for any sharpening angle. The company can



furnish flute guiding drill bushings for each diameter of drill as needed. Union Twist Drill Co.

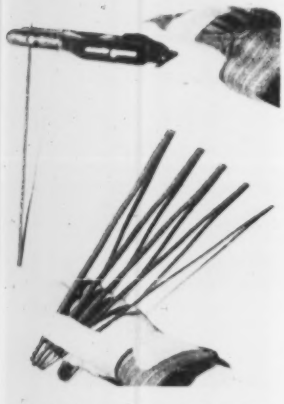
FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Hardfacing Electrodes

available in two types

A series of general-service iron-base de hardfacing electrodes having a metallic coating that provides improved weldability and arc stability is available from Wall Colmonoy.

The electrodes, made of a chromium, boron and iron composition,



are available in two types: Colmonoy No. 1 for hardfacing applications where extreme impact with high abrasion resistance is required, and Colmonoy Special No. 1 for applications where extreme abrasion and impact resistance are required. The electrodes provide dense deposits that do not require cleaning or slag removal. The deposits have uniform hardness and provide improved impact and abrasion resistance. Wall Colmonoy Corp.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 131 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Metallurgical Furnaces

Rust Furnace Co. An illustrated brochure on metallurgical furnaces describes Rust's services to industry as designer-constructor of all types of fuel-fired furnaces in melting, reheating and heat-treating fields. Many types of these industrial furnaces are depicted in the 24-page brochure.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Aluminum Conductor

Reynolds Metals Co. Expanded facilities for producing wire, cable and bus conductor to meet the demand for aluminum in the electrical industry are covered in a 4-page brochure. The Listerhill, Ala., plant is featured. Typical installations of aluminum cable, steel reinforced and all-aluminum cable as well as Neoprene covered conductor are covered.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Multipress Operation

Denison Engineering Co. Three 16-mm sound films covering operation of the Multipress are available. The films are: "Multipress . . . and How You Can Use It," a 30-minute film discussing the press and operating characteristics; "Blanking and Forming," 10-minute film showing on-the-job production scenes; and "Index to Profits," a 20-minute film describing use and design features of the hydraulic index table.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Roof Maintenance

Twinsburg-Miller Corp. A new method of roof maintenance which is reported to reduce cost of resurfacing or repairs is covered in a 4-page application folder offered by Twinsburg. An attached cost data sheet provides a comparison of costs of this new Glasfab roofing membrane to conventional methods.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Rental-Purchase Plan

Induction Heating Corp. Two bulletins cover Induction Heating's rental plan, which offers an opportunity to be convinced of economics and adaptability of the Ther-Monic process prior to purchase. A price schedule is included, together with a rental cost schedule.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Automatic Turret Lathe

Potter & Johnston Co. Bulletin No. 123 covers the P&J 5-D2 Power-Flex automatic turret lathe. A general description of the machine and the three models resulting from it are given and illustrated. General dimensions and special features are covered.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Dynamotive Drive

Automatic Transportation Co. Three models of the Dynamotive gas fork lift truck with electric transmission are described in a brochure published by Automatic. Complete specifications are given for 4, 5 and 6000-pound capacity models of the Dynamotive, which features an electric infinite step transmission.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

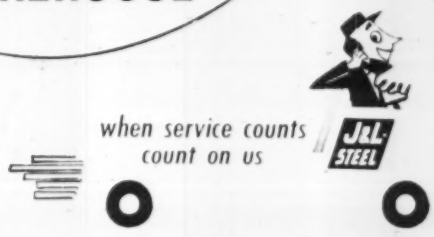
Testing Machines

Baldwin-Lima-Hamilton Corp. Two low-cost Baldwin-Tate-Emery universal testing machines of 20,000 and 60,000-pound capacity are described in 4-page Bulletin 4213. Principles of their hydraulic straining system and the Tate-Emery

going down the drain... need help?

Call your nearest

J&L STEEL WAREHOUSE



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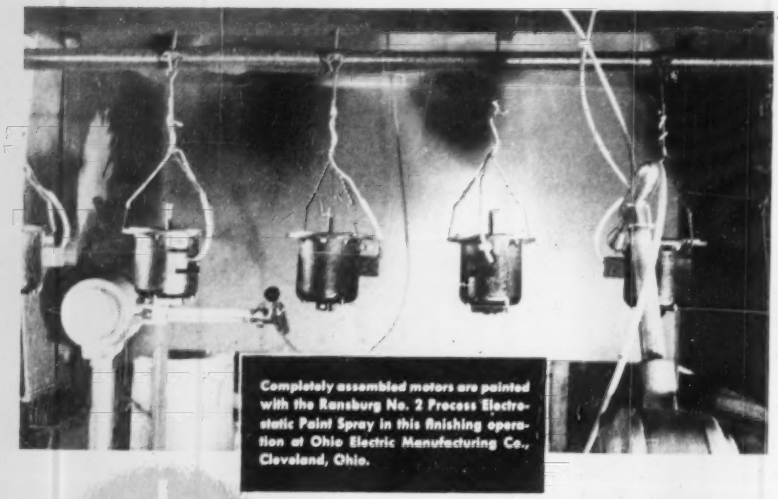
TECHNICAL SERVICE: Experienced J&L Metallurgists to help you with analyses and recommendations.

FABRICATION SERVICE: Shearing, forming, torch cutting, blanking to *your* specifications.

J&L STEEL

Jones & Laughlin

STEEL CORPORATION — *Warehouse Division*



Completely assembled motors are painted with the Ransburg No. 2 Process Electrostatic Paint Spray in this finishing operation at Ohio Electric Manufacturing Co., Cleveland, Ohio.

Here's an Unique Application of the RANSBURG No. 2 PROCESS

● Both in this country, and in foreign countries as well, the Ransburg No. 2 Process is being used by a variety of manufacturers for painting a widely varied line of products.

One of the most unusual applications of the No. 2 Process is that at Ohio Electric Manufacturing Co., Cleveland, Ohio, where completely assembled motors are painted automatically with the electrostatic paint spray.

Formerly, the motor frames, covers and terminal boxes were hand sprayed before assembly. Now, with the unmatched efficiencies of the No. 2 Process, the complete units are coated automatically with a black wrinkle enamel. As for paint mileage, they paint about 100 units an hour and use about 5 gallons of paint in an eight-hour shift. They're getting a higher quality, more uniform finish, and eliminate the paint runs which used to bother them with the former hand spray method.

See what Ransburg Electrostatic Processes will do for you in your plant. Complete facilities for test-painting YOUR products under simulated production conditions are available in Ransburg laboratories. Write for case history data on products in your field, or send for our sound and color movie, "Miracles in Painting."

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

null method load indicator are given along with descriptions of accessories and specifications.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Ram-Press Installation

Colonial Broach Co. Special surface-broaching installations of the Ram-Press broaching machine line are featured in a 4-page bulletin. Automatic and semiautomatic fixtures, hydraulic clamping and multiple broach setups are illustrated in working sequences to show load and unload positions. Described installations use multiple stations and interlocked circuits to increase production.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Perforated Steel Sheets

Joseph T. Ryerson & Son Inc. A 4-page bulletin illustrates perforated patterns available for shipment from stock. It shows other patterns supplied perforated to order from carbon and stainless steel sheets and plates, for safety, ornamental and screening purposes and for manufactured articles such as cabinets, radiator enclosures, special shelving, baskets, trays and grilles. How-to-order information, along with typical layout, covers all specification details.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Press Rebuilding

Verson Allsteel Press Co. Growing interest in opportunities for modernization of stamping presses through rebuilding prompts Verson to re-issue bulletin R-49, "New Life for Worn-Out or Damaged Presses." This 12-page bulletin outlines their rebuilding facilities and shows examples of typical rebuilding jobs.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Geared Motors

Belgian Electric Sales Corp. ACEC-SADI Geared Motor Catalog, No. CC-14A, covers the ACEC-SADI line of geared motors built to NEMA specifications. A 15-page technical brochure, it includes a complete price list, dimensions, operating characteristics and photographs and diagrams.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Belt Finishing

Minnesota Mining & Mfg. Co. A 12-page, illustrated brochure entitled "The 3M Method of Belt

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NEW PRODUCT INFORMATION

INFORMATION ON ADVERTISED PRODUCTS

FREE EDITORIAL CLIP SHEETS

Grinding and Finishing" describes the coated [illegible] use as a high-speed [illegible] grinding and finishing flat or contoured surfaces of all kinds of metal. Range extends from soft brass to super hard tungsten carbide, as well as glass, plastics, ceramics and hard rubber. Photographs and drawings illustrate eight belt machines.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Cylindrical Grinding

Landis Tool Co. A 32-page booklet is available featuring 15 case studies of successful cylindrical grinding installations. Over 60 photographs supplement text. Operation sketches and specifications are given.

FOR MORE DATA CIRCLE NO. [illegible] ON REPLY CARD

Taper-Lock

Dodge Mfg. Corp. A condensed supplement to the 16-page Taper-Lock bulletin is now available. The supplement contains up-to-date sizes, weights, dimensions and list prices of the extended line of Taper-Lock sprockets and Dodge roller chain. Covered are the line of 1½, 1¾ and 2-inch pitch sizes.

FOR MORE DATA CIRCLE NO. [illegible] ON REPLY CARD

Sprockets

Farrell-Cheek Steel Co. A folder consisting of 4 pages is devoted to the broad line of carbon and alloy cast steel sprockets manufactured by this company. A picture of each of the types available is included.

FOR MORE DATA CIRCLE NO. [illegible] ON REPLY CARD

Lubrication

Farval Corp. "Studies in Centralized Lubrication" show examples of how Farval has increased production and lowered costs in typical industries. 6 pages cover automatic pumping units for smaller machines show how the method holds transfer machines to continuous production.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

End Wheel Presses

E. W. Bliss Co. End wheel presses of all types are described and illustrated in a catalog issued by Bliss. Specifications for standard, medium and deep throat presses of fixed bed and adjustable bed designs are included.

FOR MORE DATA CIRCLE NO. [illegible] ON REPLY CARD

Air Gaging

Federal Products Corp. Catalog 53B describes the company's Dimensionair including calibrated dial, single master system with specifications and accessories. Automatic sorting and machine control applications are covered in the 23 pages.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Tangent Bending

Cyril Bath Co. A catalog describes the process of tangent bending used in metal cabinet making. 28 pages show many domestic and industrial applications of this phase of metalworking.

FOR MORE DATA CIRCLE NO. [illegible] ON REPLY CARD

Grinding Service

Marshall Steel Co. This company offers three bulletins covering their precision ground flat stock, low carbon plate grinding service and prices on 18, 24 and 36-inch long silicon killed steel of forging quality.

FOR MORE DATA CIRCLE NO. [illegible] ON REPLY CARD

Profilometer Demonstration

Micrometrical Mfg. Co. An 8-page illustrated bulletin describes

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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4-26-54

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the company's in-plant demonstration service in the Profilometer for measuring surface roughness. Bulletin shows the equipment in use and discusses what a demonstration can tell about production operations.

Hardening Machines

Cincinnati Milling Machine Co. Catalog M-1721 covers the Flamatic hardening machines, describing Flamatic hardening achievements. An extensive list of the machine parts is pictured and described, with a schematic drawing with working parts designated.

Production Story

Kearney & Trecker Corp. Solutions to production metalworking problems are suggested in a 12-page booklet featuring the story of Kearney's Special Machinery Division. Their service is described and research, engineering, manufacturing and sales information given.

Motor-Spindle Drilling

Edlund Machinery Co. Model M. S. motor spindle drilling and tapping machines are covered in Bulletin 150. Flexibility of the models is illustrated and many of the combination arrangements possible are shown. Concise tables provide pertinent engineering data and machine specifications.

Handling Line

Palmer-Shile Co. New products described in their 48-page catalog include steel boxes with lap joints, a stand and reel for handling steel coils and a new nesting-stacking box. Another new item offered is a skid box with a side door which provides easy access to materials without removing stacked boxes. Each product described is illustrated.

Plastic Metal

Chemical Development Corp. A 4-page bulletin describes a new pliable material consisting of fine steel powders and an extremely strong plastic. Called Devcon, the product is used to make permanent and durable drill jigs, fixtures, forming dies and similar products in a fraction of the time previously required and at less cost.

EDITORIAL REPRINTS:

The Right Chip Breaker

Results of the chip-breaker study sponsored by National Machine Tool Builders' Association are carried in a special report in STEEL. Longer machine life, better machining, tolerances and surfaces, easier chip disposal, safer machine operation—all are benefits of good breaker design.

Recruiting Employees

Are you being left with the leavings from which to select your future employees? An article in today's STEEL emphasizes the fact that the place to get men with the best potential is right at the colleges where they are turned out. If you run a small company this article is especially for you. STEEL has drawn up a plan for recruiting college graduates. It need not be expensive either. If what you have to offer is presented properly, you may have an advantage over the large companies.

Design for Lighting

Improved operation, ready customer acceptance go along with better illumination, says this STEEL article. Steps to follow in making seeing a part of design are covered. For ready reference: A checklist of environmental conditions to consider in incorporating improved illumination in design.

Waste Handling Profits

Eaton Mfg. Co. has turned waste handling to profit. By setting up a planned waste reclamation program they can now reclaim about 80 per cent of all cutting oil. From a capital expenditure of $79,000 for chip handling equipment and reclamation system, they realized gross savings totalling that amount in only 20 months.

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4-29-54

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STEEL

April 26, 1954

Market Outlook

POSSIBLY the hoped-for turn in the steel market is here. But while some promising signs are visible on the economic horizon, mixed conditions cloud the immediate outlook. It is still too early for definite conclusions with favorable and unfavorable influences offsetting each other.

Developments generating optimism include: 1. Consumption exceeds steel production currently; 2. prompt shipment orders are more frequent, indicating advanced inventory liquidation; 3. sales volume is up a bit, with demand a trifle more spirited; 4. seasonal upturn in wire, building items and tin plate is evident; 5. returning strength in scrap, traditional barometer for steel; 6. steel production is apparently leveling out around 70 per cent of capacity, generally believed a profitable operating point.

UNFAVORABLE FACTORS— Less favorable are the following: 1. Uncertainty as to automotive requirements over coming months; 2. uncertainty stemming from sluggish sales of consumer durables at retail level; 3. uncertainty of consumers as regards stockpiling policy; 4. uncertainty arising from the erratic course of manufacturing in some areas of steel consumption; 5. uncertainty attending approaching steel labor negotiations; 6. uncertainty injected by the explosive international political situation, especially the Indo-China crisis.

Balancing the favorable with the unfavorable provides little conclusive evidence of a trend either up or down. About the best that can be said is that the downtrend which started in steel last summer now appears halted.

SENTIMENT IMPROVES— There is no question sentiment is improving despite the continued spottiness in business generally. In some respects this reflects returning confidence attending adjustment of marketing policies to more normal conditions as traditional procurement patterns evolve.

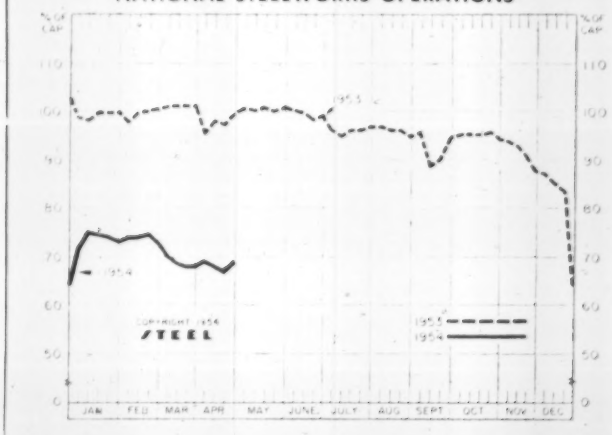
Seasonal fluctuations in demand, again in evidence not only in steel but in other lines, give eloquent testimony to the change in marketing routines since a year ago. With supplies adequate, steel purchasing is on a sounder basis than it has been in years. Buying is slower of course, with "by-guess and by-gosh" procurement out, but order volume compares favorably with that of normal years.

GETTING SQUARED AWAY— The steel market at the moment is resting on a demand plateau and may continue there through remainder of second quarter. At least April volume will likely be little better than that entertained in March and not too much pickup is yet indicated for May and June. Excess inventories and cutbacks in defense orders have been major forces behind the dip in steel over past months. Inventory liquidation, now at a point rush shipment orders are appearing, still has a way to go in certain products, sheets for instance, before buying urgency puts zip into the market.

Defense procurement adjustments are believed pretty well advanced and probably will exert decreasing influence on operations from here on. That is, of course, unless the present tense international situation explodes into a hot war, in which event the demand for steel would jump.

STEEL PRODUCTION— Ingot operations jumped two points last week to raise the national steelmaking rate to 69 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Apr. 25	Change	Same Week 1953	Same Week 1952
Pittsburgh	70	1	99.5	102.5
Chicago	68	+ 2.5*	100.5	101.5
Mid-Atlantic	82	2	92.5	96
Youngstown	62	1	106	104
Wheeling	84	14	99.5	101.5
Cleveland	75.5	9*	101	98
Buffalo	67.5	0	100.5	104
Birmingham	55.5	+ 2.5	101	102
New England	60	0	95	95
Cincinnati	61.5	+ 5	96	96
St. Louis	56.0	7	86.5	92
Detroit	60.5	+ 1.5	102	112
Western	83	1	106	101
National Rate	69	+ 2	99.5	100.5

INGOT PRODUCTION‡

	Week Ended Apr. 25	Week Ago	Month Ago	Year Ago
INDEX (1947-1949 = 100)	65.5†	65	67.1	101
NET TONS (In thousands)	1,634†	1,622	1,624	2,276

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,456 in 1953; 2,077,940 in 1952.

The Metalworking Outlook—p. 47 Technical Outlook—p. 97

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Apr. 20

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$4.575	Strip, C.R., stainless, 439	$0.415
Rails, A.C.I. 40 lb	5.767	Bars, H.R., stainless, 302		Strip, H.R., carbon	4.975
Tie Plates	5.125	Bars, H.R., stainless, 316	0.415	Pipe, black, buttweld (100 ft)	14.454
Axles, railway	7.250	Bars, H.R., carbon	4.873	Pipe, galv., buttweld (100 ft)	17.721
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, tool steel	4.900	Pipe, line (100 ft)	141.960
Plates, carbon	4.550	Bars, C.F., carbon	7.960	Casing, oil well, carbon (100 ft)	149.516
Structural Shapes	4.367	Bars, C.F., alloy	11.000	Casing, oil well, alloy (100 ft)	214.113
Piling, sheet, carbon (lb)	0.415	Bars, C.F., stainless, 302 (lb)	0.433	Tubing, boiler (100 ft)	‡
Rail, tool steel, alloy, oil hardening die (lb)	0.595	Bars, H.R., carbon	4.762	Tubing, mechanical, carbon (100 ft)	‡
Rail, tool steel, H.R., alloy, 5% chrome, oil hardening, 5% W, 1% V (lb)	1.975	Sheets, H.R., carbon	5.206	Tubing, mechanical, stainless, 304 (100 ft)	161.193
Rail, tool steel, H.R., alloy, 18% W, 4% Cr, 1% V (lb)	1.550	Sheets, C.R., carbon	5.906	Tire plate, as-dipped, 1.25 lb	$8.433
		Sheets, C.R., stainless, 302 (lb)	0.548	Tin plate, electrolytic, 0.25 lb	7.133
		Sheets, electrical	6.069	Black plate, cut, coke for cooling	6.223
		Strip, C.R., carbon	7.243	Wire, drawn, carbon	7.713
				Wire, drawn, stainless, 430 (lb)	0.545
				Plate, floor, checker	5.653
				Nails, wire, 8d common	7.488
				Wire, barbed, galvanized	6.847
				Woven wire fence, 120 rod roll	16.174

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 20 1954	Apr. 13 1954	Month Ago	Year Ago	Mar. Average
(1947-1949=100)	149.9	149.9	149.9	149.9	149.9

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 22 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	189.74	189.74	189.74	181.31	151.01
Index in cents per lb	5.140	5.140	5.140	4.912	4.172

STEEL's ARITHMETICAL PRICE COMPOSITES

	Apr. 22 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.70	$113.70	$113.70	$110.98	$94.45
No. 2 Fdry. Pig Iron, GT	56.54	56.54	56.54	55.04	46.63
Basic Pig Iron, GT	56.01	56.01	56.01	54.65	46.50
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.77
Steelmaking Scrap, GT	26.00	25.33	24.33	42.67†	23.32

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54 of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 22 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Philadelphia	4.465	4.465	4.465	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.50
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.65
Sheet, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.25
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.49
Strip, H.R., Pittsburgh	4.425	4.425	4.425	4.225	3.30
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pittsburgh	5.525	5.525	5.525	5.225-5.475	4.15
Wire, Basic, Chicago	5.525	5.525	5.525	5.225	4.15
Wire, Basic, Worcester, Mass.	6.55	6.55	6.55	6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75

SEMIFINISHED STEEL					
Billets, forging (4X) (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅜" dia.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Apr. 22 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, del. Phila.	59.66	59.66	59.66	58.16	49.59
No. 2 Fdry., Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry., Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry. del. Phila.	60.16	60.16	60.16	59.75	49.89
No. 2 Fdry., Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry. (Birm.) del. Cin.	60.13	60.13	60.13	58.63	49.13
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	260.00‡	260.00‡	260.00‡	228.00*	175.00*

*75-82% Mn, gross ton, Etna, Pa. ‡74-76% Mn, net ton

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt., Pitts.	$26.50	$26.50	$25.50	$44.00	$25.00
No. 1 Heavy Melt., E. Pa.	22.00	22.00	22.00	42.00	22.00
No. 1 Heavy Melt., Chicago	27.50	27.50	26.50	44.50	22.00
No. 1 Heavy Melt., Valley	27.50	27.50	26.50	42.00	22.00
No. 1 Heavy Melt., Cleve.	24.50	23.50	26.00	42.00	26.00
No. 1 Heavy Melt., Buffalo	27.50	27.50	24.00	45.00	23.50
Scrap, Rerolling, Chicago	29.50	31.50	31.50	51.50	31.00
No. 1 Cast, Chicago	38.50	38.50	36.00	52.50	29.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry., Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven, Fdry., Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+% ingots 21.50, pigs 20.00 for 30,000 lb or more f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 11, 12% Si, 21.30; No. 12, 5% Si, 5% Cu, 21.40; No. 142, 4% Cu, 21.40; No. 195, 4½% Cu, 1% Si, 23.50; No. 214, 3.5% Mg, 23.20; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: U.S.M. brand, 99.5% 28.50. Lots less than 1 ton add 2.00. From Laredo, Texas, in bags, carloads 25.50, 20.00 New York, 1 ton or more.

Beryllium: 97% powder or beads $21.50 per lb f.o.b. Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, 2% Be, balance Cu, at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97.99%, $3.00 per lb for 550 lb keg, $2.82 per lb for 100 lb case, $2.67 per lb for 400 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley.

Germanium: 99.9%, $295 per lb nom.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 15.50, original 12.50, corroding 13.90, St. Louis; New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% ingot, remelting 24.27, sticks and pigs 25.00, 30,000 lb or more, f.o.b. Freeport, Tex. For Dow Metal, Sr, and Madison, Ill., add 1.50 for 1, 1.25 for 2, 1.00 for 3 to 4, 0.75 for 5 to 9, 0.50 for 10 to 19, 0.25 for 20 to 39, 0.10 for 40 to 99, 0.05 for 100 to 199, 0.02 for 200 to 499, 0.01 for 500 to 999, 0.00 for 1000 lb. Mill base, Madison, Ill.

Magnesium Alloys: AZ-31, sand, allowx C, H, G, $54.15; 52-S, $1.24; 61-S, $1.30; 75-S, $2.10; 14 S.T., $2.50; 24 S.T., $1.60; 25 S.T., $1.60; 53 S.T., $1.60; 17 S.T., $2.10; 18 S.T., $2.10; 61 S.T., $1.60; 75 S.T., $2.10; 76 S.T., $2.10; 78 S.T., $2.10; 81 S.T., $1.60; 82 S.T., $1.60; 86 S.T., $1.60; 87 S.T., $1.60; 88 S.T., $1.60; 90 S.T., $1.60; 91 S.T., $1.60; 92 S.T., $1.60; 93 S.T., $1.60; 94 S.T., $1.60; 95 S.T., $1.60; 96 S.T., $1.60; 97 S.T., $1.60; 98 S.T., $1.60; 99 S.T., $1.60; 100 S.T., $1.60; 101 S.T., $1.60; 102 S.T., $1.60;

ingots for addition to cast iron, 20.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 10-lot carlots, 17.00 f.o.b.

Tantalum: Sheet, rod $39.00 per lb; powder $ 35.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, spot, 96.00 prompt, 95.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile 40.00. Be max. $4.72; grade A-2 10.0% Fe max. $4.46 per pound.

Tungsten: Powder, 98.8% carbon reduced, 1000 lb lots $1.65 per lb f.o.b. shipping point; less than 1000 lb $1.80; 99.8% hydrogen reduced, $4.50. Treated ingots $6.75.

Zinc: Prime Western 10.25, brass special 10.50, intermediate 10.75, E. St. Louis; freight allowed over 0.56 per pound. High grade 11.60, special high grade 11.75, die casting alloy ingot 14.25, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, nuclear grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 21.00-22.50; No. 12 foundry alloy (No. 2 grades) 20.00-21.00, 5% silicon alloy, 0.60 Cu max., 22.50-23.50; 13 alloy, 0.60 Cu max., 22.50-23.50; 195 alloy 21.75-22.75; 108 alloy 20.50-21.50; steel deoxidizing grades, notch bars, grades 1 and 2, 21.00-22.00; grade 2, 21.00-21.50; grade 3, 18.50-19.00; grade 4, 14.00-15.00.

Brass Ingot: Red brass, No. 115, 29.00; 319 bronze, No. 222, 35.50; No. 215, 29.25; 85-5-5-5 leaded tin bronze, No. 305, 31.00; No. 1 yellow, No. 405, 22.25; manganese bronze No. 421, 29.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.58; 50,000 lb lots, 35.48; 1 ton lots, Weatherproof, 1 ton, to 36.28; 50,000 lb, 36.53; 1 to 5 ton, Magnet wire del., 15,000 lb or more 41.83, 1-4, 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, 20.00 per cwt; pipe, full coils, $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

Prices per lb, 100,000 lb and over, f.o.b. mill: sheets $15, sheared mill plate $12, strip $15, wire $14, forging billets $8, hot-rolled and forged bars $6.

ZINC

Sheets 22.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 44,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27, H.R. strip $28, C.R. strip $35, forged or H.R. bars $27, wire 0.015 in., 1 cwt per lineal foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	81.5	66.5	86.5
R.D. Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	...	60.0	...

ALUMINUM

Aluminum ib base (round) and over 499 lb): Sheets and Circles: 28 and 38 mill finish c.l. lots.

Thickness Range Inches	Widths or Diameters, in.	Flat Sheet*	Coiled Sheet	Coiled Circle†
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.061	12-48	35.1	32.7	37.5
0.060-0.051	12-48	35.7	32.9	37.7
0.050-0.045	12-48	36.1	33.2	38.1
0.044-0.035	12-48	36.6	33.6	38.4
0.034-0.030	12-48	37.6	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.2	40.5	48.0
0.009-0.0085	12-24	44.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	56.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
61S-F	31.5	39.1
52S-F	36.2	40.9
61S-T6	37.1	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 500 lb and over.

Dia. (in.) or Across Flats	Rounds 118-T3	178-T4	Hexagonal 118-T3	178-T4
Drawn				
0.125	50.8	57.9	...	...
0.126-0.172	50.6	48.9	...	...
0.188	50.5	48.9	...	52.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	50.5
0.375	47.9	46.2	...	50.8
Cold Finished				
0.375-0.531	46.6	44.9	54.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	44.8	48.9	47.3
1.063	44.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in. diameters 0.375-5.0 in.; rectangles and squares, Class 1, 50.2-34.4 in. random lengths 0.375-4.0 in. thick, 2 in. to 7.5×11.0 in.

Pipe: A.S.A. Schedule 40, alloy 638-T6, 20 ft joints, plain ends, 50,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$ 46.30
1	27.65	4	127.75
1¼	32.00	6	278.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 24 in.× 0.064-in. 73.00; 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 5-bar, 20,000 lb or more, ¼-in. thick, widths 30-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ½ x 2 in. 65.20; 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.30. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.50, 2 x 2 x ¼-in. 62.10. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.5 b	45.5 c	...	48.44	26.000	25.000	25.250
Yellow Brass	41.72	33.50 d	42.26	44.53	19.750	19.500	18.000
Red Brass, 85%	45.44	45.28	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.74	40.67	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	48.55	48.50	47.46	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	50.13 e	51.63	...	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.05	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11 e	25.125	24.875	24.125
Manganese Bronze	43.43	43.62	54.06	...	18.250	18.000	17.500
Muntz Metal	43.96	39.77	...	...	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 17.00, low copper clipping 13.00, mixed 11.00, turnings 11.00, old sheet 10.00-11.00, borings and turnings 5.00, pistons and struts 9.00, old pistons 10.00-11.00, industrial scrap 10.00-11.00.

Copper and Brass: No. 1 copper and wire, No. 1 24.00; No. 2 copper 22.00; light copper 20.50; No. 1 composition red brass 17.50; No. 1 composition turnings 17.00; mixed brass turnings 12.50; yellow brass clippings 11.00; No. 1 brass rod turnings 13.00; light brass 15.00; heavy yellow brass 13.00; new brass rod ends 15.00; auto radiators (unsweated) 15.00; cocks and faucets 14.00; brass pipe 16.25.

Lead: Heavy 10.75-11.25; battery plates 6.25-6.75; linotype and stereotype 11.00; electrotype 11.25; mixed babbitt 12.75.

Magnesium: Clippings 15.50-19.50, clean castings 17.50-18.50, new castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00, rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 1.00-1.05; auto babbitt 1.00-1.05; No. 1 babbitt 1.00-1.05.

Zinc: Old zinc 4.50; new die cast scrap, 4.00; old die cast scrap, 2.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 28, 28 clippings 17.50-18.00, 356, 528 clippings 17.50-18.00, 148, 195, 108 clippings 14.00-14.50, mixed clippings 14.00-14.50, old sheet 13.00-13.50, old cast 13.00-13.50, clean cast cable, free of steel 15.50-16.00; borings and turnings 13.00-14.00.

Beryllium Copper: Heavy scrap, 0.020 in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 26.25-26.50, No. 2 copper 24.25-24.50, light copper 23.25-23.50, No. 1 composition borings 19.00-19.50, No. 1 composition scrap 19.50-20.00, heavy yellow brass scrap 15.25-15.50, yellow brass turnings 14.25-14.50, radiators 15.50-16.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 26.25-26.50, No. 2 copper 24.25-24.50, light copper 23.25-23.50, No. 1 composition borings 19.00-19.50, No. 1 composition scrap 19.50-20.00, heavy yellow brass scrap 15.25-15.50, yellow brass turnings 14.25-14.50, radiators 15.50-16.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb electrodeposited 39.75, oval 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00, 500-1999 lb 86.00, over 2000 lb 80.00.

Tin: Bar or slab, less than 2000 lb $1.005, 2000-4999 lb $1.15, cathodes $1.15; 1000 lb or more $1.14.

Zinc: Bar 18.50, bar or flat, cup 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb in 100 lb drums.

Chromic Acid: Less than 10,000 lb 27.50, over 10,000 lb 27.00.

Copper Cyanide: Under 1000 lb 61.00, 1000 lb and over 61.00.

Copper Sulphate: 100-500 lb 11.35, 600-1200 lb 11.10; 12,000-24,000 lb 10.85, 24,000-36,000 lb 10.60, 36,000 lb and over 10.36.

Nickel Chloride: 100-500 lb 37.00, 500-1000 lb 36.00, 1000-2000 lb 35.00, 2000-5000 lb 34.00, 5000-10,000 lb 33.00, 10,000-20,000 lb 32.00.

Nickel Sulphate: 100 lb 17.00, 200 lb 33.00, 300 lb 31.00, 400-900 lb 32.00, 1000-35,000 lb 30.00, 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 10 oz 90.625, 100 oz 79.50, 25,000 oz and over 77.375.

Sodium Cyanide: 200 under 1000 lb 19.50, 1000-19,900 lb 18.50, 20,000 lb and over 17.50, granular, add 1 cent premium to above.

Sodium Stannate: Less than 100 lb 77.5, 100-500 lb 72.5, 500-1000 lb 68.5, 1000-2000 lb 66.5, 2000-5000 lb 64.5, 5000-10,000 lb 63.5, 10,000 lb and over 62.5.

Stannous Chloride (anhydrous): Less than 500 lb $1.00, 500-1000 lb $0.98, 1000-2000 lb $0.96, 2000-5000 lb $0.94, 5000-10,000 lb $0.92, 10,000 lb and over 90.5.

Stannous Sulphate: Less than 500 lb $1.20, 500 lb to 1999 lb 1.15, 2000-5000 lb 1.10, 5000 lb and over 1.05.

Zinc Cyanide: Under 1000 lb 56.30, 1000 lb and over 52.30.

Nonferrous Metals

Customers' thinking and ordering show way to better second-quarter business for metals. Fabricators' stocks can't be cut much further without cutting efficiency

"WE DON'T JUST THINK second-quarter business will be a lot better than the first—we *know* it will be!"

This statement comes from a producer of brass mill products, an industry hard hit by slack sales for months. The conclusion is based on customers' thinking and actual ordering in the second quarter.

Widespread Much the same feeling can be found in other metals. Aluminum bookings are "way ahead" of the past three months. April copper sales will set the year's high. Lead, zinc, tin and magnesium men find more orders coming out of hiding.

The cheerfulness isn't confined to basic producers—it's their customers who set the sales pace. And fabricators of nonferrous metals are emerging from the cloud of over-pessimism that has enveloped them.

Comeback Though buying on a more restricted basis than last year at this time, fabricators are nevertheless returning to market. Many of them can't pare working stocks much more without interfering with production efficiency. Net result is shown in new bookings, highest in three months.

Passing the Buck

Lead and zinc men meeting last week (pages 56, 57) had a hot subject for corridor conversation in the new Tariff commission report which found that domestic industries need help but which significantly didn't recommend higher tariffs or other import restrictions. The question, said the commission, is one for Congress to decide. Some of the findings: Present duties on lead and zinc have little effect on regulating import volume; mine output last year was down 20 per cent in zinc and 14 per cent in lead from 1952; employment has fallen nearly a third; profits have fallen though consumption of both metals last year was 81 per cent over prewar levels.

An Oddity in Metalworking

Any month this year the primary aluminum industry doesn't set some sort of production record will be considered an oddity. March primary output, totaling 122,329 tons, topped the previous high (January) and pushed first-quarter output to 349,069 tons, another new peak.

Only installation now firmly scheduled that isn't operating is Anaconda Aluminum Co.'s 54,000-ton, $65-million plant in Montana. First potline will be producing by year end, second in the first half of next year. Other plants are in operation but haven't hit their stride yet.

Taxes Foil Profits Again

Aluminum, copper and brass companies generally fared better financially last year than lead and zinc producers, but taxes cut deeply into profits. Many new sales records were set. To see how a representative group made out, check the accompanying table.

Market Memos

• American Brass Co. is installing equipment for production of close-tolerance, thin aluminum strip at its Torrington, Conn., plant, termed the "first sizable aluminum installation" for ABC.

• "We do not anticipate any immediate change in price of copper," says Louis S. Gates, chairman, Phelps Dodge Corp. He points to evidence that world supply and demand for copper are not far from being in balance.

• "Only between 10 and 15 per cent of our nation's zinc needs can be supplied profitably at the 10-cent level," says Howard I. Young, president, American Zinc, Lead & Smelting Co. He believes the zinc industry, now at 75 per cent of plant capacity and off 37 per cent from its peak in mine tonnage, should not produce at a higher percentage of capacity than the steel industry.

High Spots from Metal Companies' Annual Reports

Company (Including Subsidiaries)		Sales	Federal Income Taxes	Net Income (After Taxes)	Earnings per Share of Common Stock
Alcoa	1953	$707,528,107	$55,400,000	$18,848,094	$1.71
	1952	577,753,399	48,600,000	43,527,142	4.19
Aluminium Ltd.	1953	335,687,924	25,671,381	19,475,087	2.16
	1952	332,993,985	35,258,018	22,372,289	2.73
American Metal	1953	unavailable	4,518,201	10,037,231	3.42
	1952	unavailable	4,857,843	9,990,831	3.40
American Smelting & Refining	1953	463,858,943	15,444,303	19,111,632	2.87
	1952	482,970,350	26,806,484	32,339,750	5.30
American Zinc, Lead & Smelting	1953	68,306,799	215,000	1,626,262	1.91
	1952	79,793,391	2,195,000	2,657,618	3.44
Anaconda	1953	439,937,087	22,142,850	30,576,519	3.52
	1952	478,123,610	29,526,563	40,091,226	4.61
Bridgeport Brass	1953	142,659,388	14,275,000	5,325,834	5.47
	1952	127,516,626	9,050,000	4,023,523	4.23
Bristol Brass	1953	unavailable	1,793,500	727,668	2.91
	1952	unavailable	860,400	413,047	1.65
Calumet & Hecla	1953	65,018,793	3,250,000	3,325,437	1.61
	1952	50,816,924	1,600,000	1,837,778	0.89
Climax Molybdenum	1953	38,907,151	4,475,000	9,717,000	3.81
	1952	29,823,642	2,600,000	6,071,519	2.41
Eagle-Picher	1953	85,033,462	2,710,000	3,242,966	3.28
	1952	81,895,067	288,000	4,035,643	4.08
General Cable	1953	116,518,850	10,200,000	5,095,416	2.29
	1952	116,351,809	11,100,000	5,283,230	2.38
International Nickel	1953	398,570,965	43,945,837	53,694,526	3.54
	1952	314,228,747	43,598,993	58,891,282	3.90
Kennecott	1953	476,688,320	90,024,569	88,687,150	8.20
	1952	471,561,697	73,580,488	86,150,718	7.96
Mueller Brass	1953	60,671,041	7,175,000	2,924,433	5.46
	1952	51,383,284	5,860,363	3,024,331	5.70
National Lead	1953	436,050,592	36,462,357	30,848,928	2.58
	1952	358,048,435	28,828,899	23,060,054	2.06
New Jersey Zinc	1953	unavailable	975,000	2,713,887	1.38
	1952	unavailable	4,500,000	12,060,192	6.15
Phelps Dodge	1953	292,445,486	31,000,000	40,766,529	4.02
	1952	262,915,557	29,200,000	37,277,549	3.67
Revere	1953	230,616,942	28,700,000	10,380,167	8.06
	1952	187,771,607	18,600,000	6,790,913	5.27
Reynolds	1953	287,802,987	16,844,661	18,320,975	10.15
	1952	234,738,789	19,726,149	14,731,071	8.12
St. Joe	1953	88,002,426	4,344,733	6,300,342	2.32
	1952	105,211,886	5,667,894	9,638,455	3.55
Scovill Mfg.	1953	125,489,218	6,629,269	3,706,066	2.62
	1952	94,282,288	2,101,118	2,620,086	1.73

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STEEL PRICES

All prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Key to footnotes, page 141.

SEMIFINISHED

INGOTS, Carbon Forging (NT)

Pittsburg,Calif. K1 $56.00
Munhall,Pa. U5 56.00

INGOTS, Alloy (NT)

Detroit R7 $83.00
Fontana,Calif. K1 83.00
Midland,Pa. C18 82.00
Munhall,Pa. U5 82.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)

Aliquippa,Pa. J5 $82.00
Bessemer,Pa. U5 82.00
Clairton,Pa. U5 82.00
Kenley,Ala. T2 82.00
Fairfield,Ala. T2 82.00
Pittsburg,Calif. K1 82.00
Gary,Ind. U5 82.00
Johnstown,Pa. B2 82.00
Lackawanna,N.Y. B2 82.00
Munhall,Pa. U5 82.00
So.Chicago,Ill. U5 82.00
So.Duquesne,Pa. U5 82.00

Carbon Forging (NT)

Aliquippa,Pa. J5 $75.50
Bessemer,Pa. U5 75.50
Buffalo,N.Y. R2 75.50
Clairton,Pa. U5 75.50
Cleveland R2 75.50
Conshohocken,Pa. A3 75.50
Detroit R7 75.50
Kenley,Ala. T2 75.50
Fairfield,Ala. T2 75.50
Fontana,Calif. K1 83.50
Gary,Ind. U5 75.50
Geneva,Utah C11 75.50
Houston S5 83.50
Johnstown,Pa. B2 75.50
Lackawanna,N.Y. B2 75.50
LosAngeles B3 83.00
Munhall,Pa. U5 75.50
Seattle B3 83.00
So.Chicago,Ill. R2,U5,W14 75.50
So.Duquesne,Pa. U5 75.50
So.SanFrancisco B3 ... 85.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 $82.00
Buffalo R2 82.00
Canton,O. R2, T7 82.00
Conshohocken,Pa. A3 86.00
Detroit R7 84.00
Fontana,Calif. K1 101.00
Gary,Ind. U5 82.00
Houston S5 86.00
Ind.Harbor,Ind. Y1 82.00
Johnstown,Pa. B2 82.00
Lackawanna,N.Y. B2 82.00
LosAngeles B3 102.00
Massillon,O. R2 82.00
Midland,Pa. C18 82.00
Munhall,Pa. U5 82.00
So.Chicago,Ill. R2,U5,W14 82.00
So.Duquesne,Pa. U5 82.00
Struthers,O. Y1 82.00
Warren,O. C17 82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 $97.00
Canton,O. R2 92.50
Cleveland R2 92.50
Fontana,Calif. K1 114.00
Gary,Ind. U5 92.50
Massillon,O. R2 92.50
So.Chicago,Ill. R2 92.50
So.Duquesne,Pa. U5 92.50

SHEET BAR (NT)

Fontana,Calif. K1 $98.00

SKELP

Aliquippa,Pa. J5 3.85
Munhall,Pa. U5 3.75
Warren,O. R2 3.75
Youngstown R2, U5 3.75

WIRE RODS

Alabama City,Ala. R2 4.525
Aliquippa,Pa. J5 4.425
Allen,Ill. L1 4.70
Buffalo,N.Y. W12 4.525
Cleveland A7 4.525
Donora,Pa. A7 4.525
Fairfield,Ala. T2 4.525
Fontana,Calif. K1 5.325
Houston S5 4.525
Johnstown,Pa. B2 4.525
Joliet,Ill. A7 4.525
Kansas City,Mo. S5 4.85
Kokomo,Ind. C16 4.625
LosAngeles B3 5.325
Minnequa,Colo. C10 4.775
Monessen,Pa. P7 4.525
No.Tonawanda,N.Y. B11 4.525
Pittsburg,Calif. C11 5.125
Portsmouth P12 4.525
Rankin,N.J. P5 4.625
So.Chicago,Ill. R2 4.525
Sparrows Point,Md. B2 4.625
Sterling,Ill. (1) S12 4.525
Struthers,O. Y1 4.525
Torrance,Calif. C11 5.325
Worcester,Mass. A7 4.825

STRUCTURALS

Carbon Steel Stand. Shapes

Alabama City,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Bessemer,Ala. T2 4.10
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fairfield,Ala. T2 4.10
Fontana,Calif. K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah C11 4.10
Houston S5 4.50
Ind.Harbor,Ind. I-2 4.10
Johnstown,Pa. B2 4.15
Kansas City,Mo. S5 4.70
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.80
Minnequa,Colo. C10 4.55
Munhall,Pa. U5 4.10
Niles,Calif. P1 4.80
Phoenixville,Pa. P4 4.15
Seattle B3 4.85
So.Chicago,Ill. U5,W14 4.10
So.SanFrancisco B3 4.75
Torrance,Calif. C11 4.80
Weirton,W.Va. W6 4.10

Wide Flange

Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fontana,Calif. K1 5.10
Lackawanna,N.Y. B2 4.15
Munhall,Pa. U5 4.10
Phoenixville,Pa. P4 4.95
So.Chicago,Ill. U5 4.10

Alloy Stand. Shapes

Clairton,Pa. U5 5.00
Fontana,Calif. K1 6.40
Gary,Ind. U5 5.00
Munhall,Pa. U5 5.00
So.Chicago,Ill. U5 5.00

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 6.175
Bessemer,Ala. T2 6.175
Bethlehem,Pa. B2 6.20
Clairton,Pa. U5 6.175
Fairfield,Ala. T2 6.175
Fontana,Calif. K1 8.825
Gary,Ind. U5 6.175
Geneva,Utah C11 6.175
Ind.Harbor,Ind. I-2 6.175
Ind.Harbor,Ind. Y1 8.875
Johnstown,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
LosAngeles B3 8.85
Munhall,Pa. U5 6.175
Seattle B3 8.90
So.Chicago,Ill. U5,W14 6.175
So.SanFrancisco B3 8.80
Struthers,O. Y1 8.875

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
Munhall,Pa. U5 6.125
So.Chicago,Ill. U5 6.125

PILING

Bearing Piles

Munhall,Pa. U5 4.10
So.Chicago,Ill. U5 4.10

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 4.925
Lackawanna,N.Y. B2 4.925
Munhall,Pa. U5 4.925
So.Chicago,Ill. U5 4.925

PLATES

PLATES, Carbon Steel

Alabama City,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Ashland,Ky. (15) A10 4.10
Bessemer,Ala. T2 4.10
Clairton,Pa. U5 4.10
Claymont,Del. C22 4.10
Cleveland,Ja. R2 4.10
Coatesville,Pa. L7 4.10
Conshohocken,Pa. A3 4.10
Ecorse,Mich. G5 4.30
Fairfield,Ala. T2 4.10
Fontana,Calif. K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah C11 4.10
Granite City,Ill. G4 4.30
Harrisburg,Pa. C5 4.10
Houston S5 4.50
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 4.10
Lackawanna,N.Y. B2 4.10
LoneStar,Tex. L6 4.40
Minnequa,Colo. C10 4.55
Munhall,Pa. U5 4.10
Riverdale,Ill. A1 4.10
Seattle B3 5.00
Sharon,Pa. S3 4.10
So.Chicago,Ill. U5, W14 4.10
Sparrows Point,Md. B2 4.10
Steubenville,O. W10 4.10
Warren,O. R2 4.10
Weirton,W.Va. W6 4.10
Youngstown,R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 5.90
Geneva,Utah C11 5.25

PLATES, Wrought Iron

Economy,Pa. B14 9.30

PLATES, High Strength Low-Alloy

Aliquippa,Pa. J5 6.25
Bessemer,Ala. T2 6.25
Clairton,Pa. U5 6.25
Cleveland J5 6.25
Conshohocken,Pa. A3 6.25
Ecorse,Mich. G5 6.45
Fairfield,Ala. T2 6.25
Fontana,Calif.(30) K1 6.95
Gary,Ind. U5 6.25
Geneva,Utah C11 6.25
Ind.Harbor,Ind. I-2 6.25
Ind.Harbor,Ind. Y1 6.75
Johnstown,Pa. B2 6.25
Lackawanna,N.Y. B2 6.25
Munhall,Pa. U5 6.25
Pittsburgh J5 6.25
Seattle B3 7.15
Sharon,Pa. S3 6.25
So.Chicago,Ill. U5, W14 6.25
Sparrows Point,Md. B2 6.25
Youngstown U5 6.25
Youngstown,Y1 6.75

PLATES, Alloy

Claymont,Del. C22 5.55
Coatesville,Pa. L7 5.55
Fontana,Calif. K1 6.60
Gary,Ind. U5 5.55
Johnstown,Pa. B2 5.55
Munhall,Pa. U5 5.55
Sharon,Pa. S3 5.55
So.Chicago,Ill. U5, W14 5.55
Sparrows Point,Md. B2 5.55

FLOOR PLATES

Cleveland J5 5.15
Conshohocken,Pa. A3 5.15
Harrisburg,Pa. C5 5.15
Ind.Harbor,Ind. I-2 5.15
Munhall,Pa. U5 5.15
So.Chicago,Ill. U5 5.15

PLATES, Ingot Iron

Ashland (15) A10 4.35
Ashland (15) A10 4.50
Cleveland R2 4.70
Warren,O. R2 4.70

BARS

BARS, Hot Rolled Carbon

Aliquippa,Pa. J5 4.15
Allen,Ill. L1 4.35
Atlanta,Ga. A11 4.35
Bessemer,Ala. T2 4.15
Birmingham,Ala. C15 4.15
Buffalo(31) R2 4.15
Clairton,Pa. U5 4.15
Cleveland(31) R2 4.21
Detroit R7 4.30
Ecorse,Mich. G5 4.35
Emeryville,Calif. J7 4.60
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 4.30
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Gadsden,Ala.(31) R2 4.15
Houston S5 4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
Kansas City,Mo. S5 4.75
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. M18 4.15
Minnequa,Colo. C10 4.60
Niles,Calif. P1 4.85
N.Tonawanda,N.Y. B11 4.15
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
Portland,Oreg. O4 4.94
Seattle B3, N14, P23 4.90
So.Chicago,Ill. W14 4.15
Cumberland,Md.(5) C19 4.22
So.Duquesne,Pa. U5 4.15
So.SanFran.,Calif. B7 4.90
Sterling,Ill.(1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Weirton,W.Va. W6 4.15
Youngstown U5 4.15
Youngstown,31 R2 4.20

Bars, Hot-Rolled Alloy

Bethlehem,Pa. B2 4.875
Buffalo R2 4.875
Canton,O. R2, T7 4.875
Clairton,Pa. U5 4.875
Detroit R7 4.975
Ecorse,Mich. G5 5.075
Fairless,Pa. U5 5.025
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.875
Houston S5 5.275
Ind.Harbor,Ind. I-2,Y1 4.875
Johnstown,Pa. B2 4.875
Kansas City,Mo. S5 5.475
Lackawanna,N.Y. B2 4.875
LosAngeles B3 5.925
Massillon,O. R2 4.875
Midland,Pa. C18 4.875
So.Chicago,R2,U5,W14 4.875
So.Duquesne,Pa. U5 4.875
Struthers,O. Y1 4.875
Struthers,O. C17 4.875
Warren,O. C17 4.875
Youngstown U5 4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 6.225
Bessemer,Ala. T2 6.225
Bethlehem,Pa. B2 6.225
Clairton,Pa. U5 6.225
Ecorse,Mich. G5 6.425
Fairfield,Ala. T2 6.225
Fontana,Calif. K1 7.475
Gary,Ind. U5 6.225
Ind.Harb.,Ind. Y1 6.725
Ind.Harb.,Ind. I-2 6.225
Johnstown,Pa. B2 6.225
Lackawanna,N.Y. B2 6.225
LosAngeles B3 6.925
Pittsburgh J5 6.225
Seattle B3 6.975
So.Chicago,W14 6.225
So.Duquesne,Pa. U5 6.225
So.SanFrancisco B3 6.975
Struthers,O. Y1 6.725
Youngstown U5 6.225

BAR SIZE ANGLES,H.R.CARBON

Bethlehem,Pa. B2 4.35

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5 4.15
Atlanta,A11 4.35
Clairton,Pa. U5 4.85
SanFrancisco,S7 5.10

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 5.00
Fontana,Calif. K1 5.925
Gary,Ind. U5 5.00
Houston S5 5.60
KansasCity,S5 5.60
Youngstown U5 5.00

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 5.20
BeaverFalls,Pa. M12,R2 5.20
Buffalo R2 5.20
Camden,N.J. P13 5.60
Carnegie,Pa. C12 5.20,
Chicago W18 5.20
Cleveland A7, C20 5.20
Detroit P17, R7 5.30
Detroit B5 5.40
Donora,Pa. A7 5.20
Elyria,O. W8 5.20
FranklinPark,Ill. N5 5.20
Gary,Ind. R2 5.20
GreenBay,Wis. F7 5.20
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 5.75
Harvey,Ill. B5 5.20
LosAngeles,R2, S30 6.65
Mansfield,Mass. B5 5.75
Massillon,O. R2, R5 5.20
Monaca,Pa. S17 5.20
Newark,N.J. W18 5.65
NewCastle,Pa.(17) B1 5.20
Pittsburgh J5 5.20
Plymouth,Mich. P5 5.45
Putnam,Conn. W18 5.75
Readville,Mass. C14 5.75
St.Louis,Mo. M5 5.50
So.Chicago,Ill. W14 5.20
SpringCity,Pa. K3 5.65
Struthers,O. Y1 5.20
Waukegan,Ill. A7 5.20
Worcester,Mass. W19 6.10
Youngstown,Y1 5.20

BARS, Cold-Finished Alloy (Turned and Ground)

Cumberland,Md.(5) C19 4.45

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 6.325
BeaverFalls,Pa. M12 6.325
Bethlehem,Pa. B2 6.325
Buffalo R2 6.325
Camden,N.J. P13 6.50
Canton,O. R2, T2 6.325
Carnegie,Pa. C12 6.325
Chicago W18 6.325
Cleveland A7, C20 6.325
Detroit R7 6.425
Detroit P17 6.475
Detroit B5 6.325
Donora,Pa. A7 6.325
Elyria,O. W8 6.325
Gary,Ind. R2 6.325
Hammond,Ind. L2,M13 6.325
Hartford,Conn. R2 6.775
Harvey,Ill. B5 6.325
Lackawanna,N.Y. B2 6.325
Mansfield,Mass. B5 6.775
Massillon,O. R2, R5 6.325
Midland,Pa. C18 6.325
Monaca,Pa. S17 6.325
Newark,N.J. W18 6.65
Plymouth,Mich. P5 6.525
So.Chicago,Ill. R2,W14 6.325
SpringCity,Pa. K3 6.50
Struthers,O. Y1 6.325
Warren,O. C17 6.325
Waukegan,Ill. A7 6.325
Worcester,Mass. A7 6.625
Youngstown,R5, Y1 6.325

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 4.15
Atlanta,A11 4.35
Birmingham,Ala. C15 4.15
Buffalo R2 4.15
Cleveland R2 4.15
Emeryville,Calif. J7 4.60
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 4.30
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Houston S5 4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.75
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. M18 4.15
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.85
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
SandSprings,Okla. S5 5.00
Seattle B3, N14, P23 4.90
So.Chicago,Ill. R2 4.15
So.Duquesne,Pa. U5 4.15
So.SanFrancisco B3 4.90
SparrowsPoint,Md. B2 4.15
Sterling,Ill.(1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Youngstown R2, U5 4.15

BARS, Reinforcing (Fabricated, to consumers)

Johnstown,Pa. B2 5.50
KansasCity,So 6.35
LosAngeles B3 5.90
Marion,O. P11 5.55
Seattle N14 5.80
Seattle B3, P23 5.90
So.SanFrancisco,B3 5.85
SparrowsPt.,Md. B2 5.55
Williamsport,Pa. S19 5.45

RAIL STEEL BARS

Avis,Pa.(3) J8 4.25
Chicago Hts.(3) C2, I-2 4.65
Chicago Hts.(4) C2, I-2 4.75
Ft.Worth,Tex.(26) T4 4.55
Franklin,Pa.(3) F5 4.15
Franklin,Pa.(4) F5 4.15
Marion,O.(3) SP11 4.00
Moline,Ill.(3) B2 4.15
Tonawanda,(3,4) B12 4.15
Williamsport,Pa.(3) S19 4.25
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron

Economy,Pa.(8 R,S) B14 10.40
Economy,Pa.(4) B,S B14 12.90
Economy(Staybolt) B14 13.20
M&K Rks.(8 R,S) I5 10.40
M&K Rks.(4) R,S I5 14.00
M&K Rks(Staybolt) I5 15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Alabama City,Ala. R2 3.925
Allenport,Pa. P7 3.925
Ashland,Ky.(8) A10 3.925
Cleveland,Ja. R2 3.925
Conshohocken,Pa. A3 3.925
Detroit M1 4.125
Ecorse,Mich. G5 4.125
Fairfield,Ala. T2 3.925
Fairless,Pa. U5 3.975
Fontana,Calif. K1 4.70
Gary,Ind. U5 3.925
Geneva,Utah C11 4.025
Granite City,Ill. G4 4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 3.925

Kokomo,Ind. C16 ... 4.025
Lackawanna,N.Y. B2 ... 3.925
Munhall,Pa. U5 ... 3.925
Newport,Ky. N9 ... 3.925
Niles,O. N12 ... 3.975
Pittsburg,Calif. C11 ... 4.625
Pittsburgh,Pa. U5 ... 3.925
Portsmouth,O. P12 ... 3.925
Riverdale,Ill. A1 ... 3.925
Sharon,Pa. S3 ... 3.925
So.Chicago,Ill. W14 ... 3.925
Sparrows Point,Md. B2 3.925
Steubenville,O. W10 ... 3.925
Torrance,Calif. C11 ... 4.625
Warren,O. R2 ... 3.925
Weirton,W.Va. W6 ... 3.925
Youngstown,O. Y1 ... 3.925

SHEETS, H.R. (19 gage)
Alabama City,Ala. R2 ... 5.225
Dover,O. R1 ... 5.275
Kokomo,Ind. C16 ... 5.025
Mansfield,O. E6 ... 5.05
Niles,O. N12 ... 4.775
Torrance,Calif. C11 ... 5.875

SHEETS, H.R. (14 ga. heavier) High Strength Low-Alloy
Cleveland,O. J5, R2 ... 5.90
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.10
Fairfield,Ala. T2 ... 5.90
Fairless,Pa. U5 ... 5.95
Fontana,Calif. K1 ... 6.625
Gary,Ind. U5 ... 5.90
Ind.Harbor,Ind. I-2 ... 5.90
Ind.Harbor,Ind. Y1 ... 6.40
Irvin,Pa. U5 ... 5.90
Lackawanna,N.Y. B2 ... 5.90
Munhall,Pa. U5 ... 5.90
Pittsburgh,Pa. J5 ... 5.90
Sharon,Pa. S3 ... 5.90
So.Chicago,Ill. U5 ... 5.90
Sparrows Point,Md. B2 ... 5.90
Warren,O. R2 ... 5.90
Weirton,W.Va. W6 ... 5.90
Youngstown,O. U5 ... 5.90
Youngstown,O. Y1 ... 6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ... 4.175
Cleveland,O. R2 ... 4.525
Ind.Harbor,Ind. I-2 ... 4.175
Warren,O. R2 ... 4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 ... 4.775
Cleveland,O. J5, R2 ... 4.775
Ecorse,Mich. G5 ... 4.975
Fairfield,Ala. T2 ... 4.775
Fairless,Pa. U5 ... 4.825
Follansbee,W.Va. F4 ... 4.775
Fontana,Calif. K1 ... 5.875
Gary,Ind. U5 ... 4.775
Granite City,Ill. G4 ... 4.975
Ind.Harbor,Ind. I-2,Y1 ... 4.775
Irvin,Pa. U5 ... 4.775
Lackawanna,N.Y. B2 ... 4.775
Middletown,O. A10 ... 4.775
Pittsburg,Calif. C11 ... 5.725
Pittsburgh,Pa. U5 ... 4.775
Portsmouth,O. P12 ... 4.775
Sparrows Point,Md. B2 ... 4.775
Steubenville,O. W10 ... 4.775
Warren,O. R2 ... 4.775
Weirton,W.Va. W6 ... 4.775
Youngstown,O. Y1 ... 4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland,O. J5, R2 ... 7.225
Ecorse,Mich. G5 ... 7.425
Fairless,Pa. U5 ... 7.375
Fontana,Calif. K1 ... 8.275
Gary,Ind. U5 ... 7.225
Indiana Harbor,Ind. Y1 7.725
Irvin,Pa. U5 ... 7.325
Lackawanna,N.Y. B2 ... 7.225
Pittsburgh,Pa. U5 ... 7.225
Sparrows Point,Md. B2 7.225
Warren,O. R2 ... 7.225
Weirton,W.Va. W6 ... 7.225
Youngstown,O. Y1 ... 7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland,O. R2 ... 5.325
Middletown,O. A10 ... 5.275
Warren,O. R2 ... 5.325

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	
Canton,O. R2	6.075	6.525
Fairfield,Ala. T2	6.075	6.525
Gary,Ind. U5	6.025	6.525
Ind.Harbor,Ind. I-2	6.075	6.525
Irvin,Pa. U5	6.075	6.525
Kokomo,Ind. C16	6.175	
Martins Ferry,O. W10	6.075	
Pitts.,Calif. C11	6.825	
Sparrows Pt.,Md. B2	6.075	
Torrance,Calif. C11	7.075	

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.525
Fairfield,Ala. T2	6.525
Martins Ferry,O. W10	6.525

SHEETS, Galv'd No. 10 Steel
Alabama City,Ala. R2 ... 5.275
Ashland,Ky.(8) A10 ... 5.275
Canton,O. R2 ... 5.275
Delphos,O. N16 ... 5.775
Dover,O. R1 ... 5.275
Fairfield,Ala. T2 ... 5.275†
Gary,Ind. U5 ... 5.275†
Granite City,Ill. G4 ... 5.475
Ind.Harbor,Ind. I-2 ... 5.275
Irvin,Pa. U5 ... 5.275†
Kokomo,Ind. C16 ... 5.375†
Martins Ferry,O. W10 ... 5.275
Niles,O. N12 ... 5.275
Pittsburg,Calif. C11 ... 6.025†
Sparrows Point,Md. B2 5.275
Steubenville,O. W10 ... 5.275
Torrance,Calif. C11 ... 6.275†
Weirton,W.Va. W6 ... 5.275

† Based on 5c zinc

SHEETS, Galvanized No. 10 High Strength Low-Alloy
Irvin,Pa. U5 ... 7.925
Sparrows Point(39) B2 8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ... 5.525
Canton,O. R2 ... 6.025

SHEETS, Galvannealed Steel
Canton,O. R2 ... 5.825
Irvin,Pa. U5 ... 5.825†
Kokomo,Ind. C16 ... 5.925†
Niles,O. N12 ... 5.825

† Based on 5c zinc

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 ... 5.525
Middletown,O. A10 ... 5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 ... 5.775
Middletown,O. A10 ... 5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) ... 6.125
Niles,O. R2 (28) ... 6.125
Weirton,W.Va. W6 ... 5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 ... 8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ... 5.175
Cleveland,O. R2 ... 5.175
Gary,Ind. U5 ... 5.175
Granite City,Ill. G4 ... 5.375
Ind.Harbor,Ind. I-2 ... 5.175
Irvin,Pa. U5 ... 5.175
Middletown,O. A10 ... 5.175
Niles,O. N12 ... 6.525
Youngstown,O. Y1 ... 5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ... 7.30
Follansbee(23) F4 ... 7.175
Yorkville,O. W10 ... 7.20

SHEETS, Long Terne, Steel (Commercial Quality)
Beech Bottom,W.Va. W10 5.675
Gary,Ind. U5 ... 5.675
Mansfield,O. E6 ... 5.675
Middletown,O. A10 ... 5.675
Niles,O. N12 ... 5.675
Weirton,W.Va. W6 ... 5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ... 6.075

SHEETS, Well Casing
Fontana,Calif. K1 ... 6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ... 3.925
Allenport,Pa. P7 ... 3.925
Alton,Ill. L1 ... 4.10
Ashland,Ky.(8) A10 ... 3.925
Atlanta, A11 ... 4.125
Bessemer,Ala. T2 ... 3.925
Birmingham,Ala. C15 ... 3.925
Bridgeport,Conn.(10) S15 3.95
Buffalo(27) R2 ... 3.925
Carnegie,Pa. S18† ... 4.425
Conshohocken,Pa. A3 ... 4.05
Detroit, M1 ... 4.125
Ecorse,Mich. G5 ... 4.125
Fairfield,Ala. T2 ... 3.925
Fontana,Calif. K1 ... 4.70
Gary,Ind. U5 ... 3.925
Houston,Tex. S9 ... 4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 3.925
Kansas City,Mo. S5 ... 4.525
Lackawanna,N.Y.(25) B2 3.925
Los Angeles(25) B3 ... 4.675
Mansfield,O. E6 ... 3.925
Manhegan,Conn. C10 ... 5.025
New Britain,Conn. S15 ... 4.15
N.Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ... 4.675
Portsmouth,O. P12 ... 3.925
Riverdale,Ill. A1 ... 3.925
San Francisco S7 ... 5.10
Seattle(25) B3, F2 ... 4.925
Seattle,Wash. S14 ... 4.925
Sharon,Pa. S3 ... 3.925
So.Chicago,Ill. W14 ... 3.925
So.San Francisco(25) B3 4.675
Sparrows Point,Md. B2 3.925
Torrance,Calif. C11 ... 4.675
Warren,O. R2 ... 3.925
Weirton,W.Va. W6 ... 3.925
Youngstown,O. U5 ... 3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10) S15 6.45
Carnegie,Pa. S18 ... 6.40
Fontana,Calif. K1 ... 7.80
Gary,Ind. U5 ... 6.40
Houston,Tex. S5 ... 6.80
Kansas City,Mo. S5 ... 7.00
Los Angeles B3 ... 7.60
New Britain,Conn.(10) S15 6.45
Sharon,Pa. S3 ... 6.40
So.Chicago,Ill. W14 ... 6.40
Youngstown,O. U5 ... 6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 ... 5.95
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.15
Fairfield,Ala. T2 ... 5.95
Fontana,Calif. K1 ... 7.05
Gary,Ind. U5 ... 5.95
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y-1 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Los Angeles(25) B3 ... 6.70
Seattle(25) B3, F23 ... 6.95
Sharon,Pa. S3 ... 5.95
So.San Francisco(25) B3 6.70
Sparrows Point,Md. B2 ... 6.00
Warren,O. R2 ... 5.90
Weirton,W.Va. W6 ... 5.90
Youngstown,O. Y1 ... 6.45
Youngstown,O. U5 ... 5.90

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ... 4.125
Warren,O. R2 ... 4.425

STRIP, Cold-Rolled Carbon
Anderson,Ind. G3 ... 5.45
Bridgeport,Conn.(10) S15 5.45
Cleveland,O. A7, J5 ... 5.45
Dearborn,Mich. D3 ... 5.65
Detroit,Mich. D2, M1, P20 ... 5.65
Dover,O. G6 ... 5.45
Ecorse,Mich. G5 ... 5.65
Follansbee,W.Va. F4 ... 5.45
Fontana,Calif. K1 ... 7.35
Franklin Park,Ill. P6 ... 5.70
Ind.Harbor,Ind. I-2 ... 5.70
Indianapolis,Ind. C5 ... 5.60
Lackawanna,N.Y. B2 ... 5.45
Los Angeles,Calif. C1 ... 7.50
Mattapan,Mass. T6 ... 6.10
Middletown,O. A10 ... 5.45
New Bedford,Mass. R10 ... 6.00
New Britain,Conn. S15 ... 5.45
New Castle,Pa. B4, E5 ... 5.45
New Haven,Conn. A7 ... 6.20
New Haven,Conn. D2 ... 5.50
Pawtucket,R.I. N8, R3 ... 6.10
Pittsburgh,Pa. J5 ... 5.45
Riverdale,Ill. A1 ... 5.70
Rome,N.Y.(32) R6 ... 5.45
Sharon,Pa. S3 ... 5.45
Sparrows Point,Md. B2 ... 5.45
Trenton,N.J. R5 ... 7.00
Wallingford,Conn. W2 ... 5.90
Warren,O.(40) T5 ... 5.45
Warren,O. B9, R2 ... 5.45
Weirton,W.Va. W6 ... 5.45
Worcester,Mass. A7 ... 6.30
Youngstown,O. Y1 ... 5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 ... 12.00
Cleveland,O. A7 ... 12.00
Dover,O. G6 ... 12.00
Fontana,Calif. K1 ... 13.65
Harrison,N.J. C18 ... 12.00
Pawtucket,R.I.(11), NS 12.15
Pawtucket,R.I.(12), NS 12.45
Sharon,Pa. S3 ... 12.00
Worcester,Mass. A7 ... 12.30
Youngstown,O. S ... 12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland,O. J5 ... 7.80
Dover,O. G6 ... 8.15
Dearborn,Mich. D3 ... 7.90
Dover,O. G6 ... 8.00
Ecorse,Mich. G5 ... 8.25
Lackawanna,N.Y. B2 ... 8.15
Pittsburgh,Pa. J5 ... 7.80
Sharon,Pa. S3 ... 7.85
Sparrows Point,Md. B2 ... 8.15
Warren,O. R2 ... 7.60
Weirton,W.Va. W6 ... 8.15
Youngstown,O. Y1 ... 8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 ... 6.05

STRIP, Electrogalvanized
Dover,O. G6 ... 5.45
Warren,O. B9, T5 ... 5.45
Weirton,W.Va. W6 ... 5.45
Youngstown,O. S ... 5.70

TIGHT COOPERAGE HOOP
Atlanta, A11 ... 4.65
Riverdale,Ill. A1 ... 4.50
Sharon,Pa. S3 ... 4.35
Youngstown,O. U5 ... 4.25

Key to Producers

A1 Acme Steel Co.
A2 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angel Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A12 American Cladmetal Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc
B6 Blackburn Alloy Steel
B9 Bridgeport Steel Div. Borg Warner Corp.
B10 E. & G. Brooke Wire Co.
B11 Buffalo Bolt Co., Div. Buffalo Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Cannon Steel Div. Borg Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Harsco Steel Corp.
C7 Coast Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Columbia Tool Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Cuyamont Steel Products
C23 Dept. Water & Power Steel Division
C25 Charter Wire Products
C24 G. O. Carlton Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Detroit & Steel Heavy
D6 Detroit Wire Corp.
D7 Detroit Western Steel
D8 Dominion Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Empire Metallurgical Co.
E5 Empire Steel & Tin Co.
E6 Empire Wire Co.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg Warner Corp.
F6 Fretz Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Iron Co.
G3 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Harris Furnace Corp.
H2 Helical Tube Co.
I-1 Ipsco Steel Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Interstate Steel Div. Borg Warner Corp.
I-7 Ingersoll Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J2 Jessop Steel Co.
J3 Johnson Steel & Wire Co.
J4 Jones & Laughlin Steel
J5 Jones, Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Keystone Steel Corp.
K2 Kenilee Electric Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 Lasalle Steel Co.
L3 Latrobe Steel Co.
L4 Lockhart Bolt & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Manning, Maxwell & Moore
M5 Medart Co.
M6 Mercer Pipe Div. Shaw-Perkins Tubular Products
M8 Mid-States Steel & Wire
M10 Multrup Steel Products
M13 Maysteel Steel Co.
M15 Mid-Erie & Special Wire
M17 Metals Forming Corp.
M18 Mystic Steel Prod. Div. Mystic Chaplain & Scott
N2 National Supply Co.
N3 National Tube Div.
N4 National Steel & Wire Co.
N5 New Eng. High Carb. Wire
N6 Newman Crosby Steel
N7 Newport Steel Corp.
N12 New Rivers Mill Div.
N14 National Steel Prod. Mills
N15 Northwestern S. & W. Co.
O10 Saw Tie Blade Mfg. Co.
O11 Oliver Iron & Steel Corp.
O12 Owen Steel Co.
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pacific Drawn Steel
P6 Pittsburgh Screw & Bolt Co.
P7 Pittsburgh Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div. Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons Co., John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reinforced Rolled Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S2 Sharon Steel Corp.
S3 Sharon Tube Co.
S4 Sheffield Steel Corp.
S6 Sherriden Forging Co.
S7 Simonds Saw & Steel Co.
S8 Simonds Worden White
S13 Standard Forging Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Strutters Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S22 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
T2 Tenn. Coal & Iron Div. Fed. Steel & Cable
T3 Texas Steel Co.
T5 Thomas Strip Division Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U1 Universal Cyclops Steel
U4 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich & Stas. Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W5 Wayne Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wear Ease Split Shot
W9 Steel and Tube Div. Cleveland Graphite Bronze
W10 Wickwire Spencer Steel
W11 Inc. Coke, Fuel & Iron
W13 Young Steel & Wire Co.
W14 Interstate Steel Co.
W15 Wyckoff Steel Co.
W16 Worcester Pressed Steel
W17 Worthington Steel & Tube

STRIP, Cold-Finished

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
Bridgeport Conn. (1)					
Bristol, Conn. (1)					
Carnegie Pa. (2)					
Cleveland (1)					
Coatesville Pa. (2)					
Detroit Metro. Area (1)					
Detroit (2)					
Dover, O. (1)					
Fitzwilliam N. H. (1)					
Harrison, N. J. (1)					
Hartford, Conn. (1)					
Indianapolis, Ind. (1)					
Lockport, N. Y. (1)					
Massillon, O. (1)					
Middletown, Conn. (1)					
New Castle, Pa. (1)					
New Castle, Pa. (2)					
New Haven, Conn. (1)					
New Haven, Conn. (2)					
New York, N. Y. (1)					
Pawtucket, R. I. (1)					
Pawtucket, R. I. (2)					
Sharon, Pa. (1)					
Trenton, N. J. (1)					
Waterbury, Conn. (1)					
Watervliet, N. Y. (1)					
Westfield, Mass. (1)					
Worcester, Mass. (1)					
Worcester, Mass. (2)					
Worcester, Mass. (3)					
Youngstown, O. (1)					

Spring Steel (Tempered)

Buffalo, N. Y. (2)	12.50			
Bristol, Conn. (1)	12.50	13.00		
Bristol, Conn. (2)	12.50	13.00	13.50	14.00
Fitzwilliam, N. H. (1)	12.50	13.00	13.50	14.00
Harrison, N. J. (1)	12.50	13.00	13.50	14.00
Sharon, Pa. (1)	12.50	13.00	13.50	14.00
Sharon, Pa. (2)	12.50	13.00	13.50	14.00
Trenton, N. J. (1)	12.50	13.00	13.50	14.00
Worcester, Mass. (1)	12.50	13.00	13.50	14.00
Worcester, Mass. (2)	12.50	13.00	13.50	14.00

SILICON STEEL

H.R. SHEETS (22 gage)

(Cut Lengths)	Armature Field	Electric	Motor	Dynamo
Beech Bottom, W. Va. (1)				
Brackenridge, Pa. (1)				
Indiana Harbor, Ind. (1)				
Mansfield, O.				
Newport, Ky.				
Niles, O. (1)				
Vandergrift, Pa. (1)				
Warren, O. (2)				
Zanesville, O. (1)				

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed 1/2c lower)	Armature Field	Electric	Motor	Dynamo
Granite City, Ill. (1)				
Indiana Harbor, Ind. (1)				
Vandergrift, Pa. (1)				
Warren, O. (2)				

H.R. SHEETS (22 Gage)

(Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
Beech Bottom, W. Va. (1)				
Brackenridge, Pa. (1)				
Newport, Ky. (1)				
Vandergrift, Pa. (1)				
Zanesville, O. (1)				

C.R. COILS & CUT LENGTHS (22 Ga.)

	T-100	T-90	T-80	T-73	T-72
Butler, Pa. (1)					
Vandergrift, Pa. (1)					
Warren, O. (2)					

* Semiprocessed. Fully processed same. Order by desired semiprocessed core loss.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa.	$2.10	$2.60	$3.05
Fairfield, Ala. (2)			
Fairless, Pa.			
Gary, Ind.			
Granite City, Ill. (1)			
Indiana Harbor, Ind. (1), (3)			
Irvin, Pa.			
Niles, O. (2)			
Pittsburg, Calif. (1)			
Sparrows Point, Md. (2)			
Weirton, W. Va.			
Yorkville, O. (1)			

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa, Pa. (4)		
Fairfield, Ala. (2)		
Fairless, Pa.		
Gary, Ind.		
Granite City, Ill. (1)		
Indiana Harbor, Ind. (1), (3)		
Irvin, Pa.		
Niles, O. (2)		
Pittsburg, Calif. (1)		
Sparrows Point, Md. (2)		
Weirton, W. Va.		
Yorkville, O. (1)		

BLACK PLATE (Base Box)

Aliquippa, Pa.	$6.90
Fairfield, Ala. (2)	
Fairless, Pa.	
Gary, Ind.	
Granite City, Ill. (1)	
Indiana Harbor, Ind. (1), (3)	
Niles, O. (2)	
Pittsburg, Calif. (1)	
Sparrows Point, Md. (2)	
Weirton, W. Va.	
Yorkville, O. (1)	

HOLLOWARE ENAMELING
Black Plate (29 gage)

Aliquippa, Pa.	$6.30
Gary, Ind.	6.30
Granite City, Ill.	6.30
Indiana Harbor, Ind. (1), (3)	6.30
Irvin, Pa.	6.30
Niles, O. (2)	6.30
Pittsburg, Calif. (1)	6.40
Sparrows Point, Md. (2)	6.30
Weirton, W. Va.	6.30
Yorkville, O. (1)	6.30

MANUFACTURING TERNES
(Special Coated)

Fairfield, Ala. (2)	$7.50
Gary, Ind.	7.40
Irvin, Pa.	7.40
Yorkville, O. (1)	7.40

MANUFACTURING TERNES, 8 lb
(Commercial Quality)

Gary, Ind.	$7.40
Indiana Harbor, Ind. (1), (3)	7.40
Yorkville, O. (1)	7.40

MANUFACTURING TERNES, LT
Coated, 6 lb

Niles, O. (2)	$7.40
Yorkville, O. (1)	7.40

ROOFING SHORT TERNES
(8 lb Coated)

Gary, Ind.	$7.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

Aliquippa, Pa.	
Atlanta, Ga.	
Bartonville, Ill. (1)	
Buffalo, N. Y.	
Chicago, Ill.	
Cleveland, O.	
Crawfordsville, Ind.	
Fairfield, Ala.	
Fostoria, O.	
Houston, Tex.	
Jacksonville, Fla.	
Johnstown, Pa.	
Kokomo, Ind.	
Los Angeles, Calif.	
Minneapolis, Minn.	
Monessen, Pa.	
Palmer, Mass.	
Portsmouth, O.	
Rankin, Pa.	
Sparrows Point, Md.	
Struthers, O.	
Waukegan, Ill.	
Worcester, Mass.	

WIRE, MB Spring, High Carbon

Aliquippa, Pa. (1)	
Allen, Ill. (1)	
Bartonville, Ill. (1)	
Buffalo, N. Y.	
Cleveland, O.	
Duluth, Minn.	
Fostoria, O.	
Johnstown, Pa.	
Los Angeles, Calif.	
Moline, Ill. (1)	
Monessen, Pa.	
Palmer, Mass.	
Portsmouth, O.	
Rankin, Pa.	
Sparrows Point, Md.	
Struthers, O.	
Trenton, N. J.	
Waukegan, Ill.	
Worcester, Mass.	

WIRE, Upholstery Spring

Aliquippa, Pa.	
Allen, Ill. (1)	
Buffalo, N. Y.	
Cleveland, O.	
Donora, Pa.	
Duluth, Minn.	
Johnstown, Pa.	
Los Angeles, Calif.	
Monessen, Pa.	
Newaukegan, Ill.	
Palmer, Mass.	
Pittsburg, Calif.	
Portsmouth, O.	
Roebling, N. J.	
Sharon, Pa.	
So. Chicago, Ill.	
So. San Francisco, Calif.	
Sparrows Point, Md.	
Trenton, N. J.	
Waukegan, Ill.	
Worcester, Mass.	

WIRE, Fine & Weaving (18 Coils)

Aliquippa, Pa.	
Bartonville, Ill.	
Buffalo, N. Y.	
Chicago, Ill.	
Cleveland, O.	
Crawfordsville, Ind.	
Donora, Pa.	
Fostoria, O.	
Johnstown, Pa.	
Kokomo, Ind.	
Monessen, Pa.	
Palmer, Mass.	
Portsmouth, O.	
Rankin, Pa.	
Roebling, N. J.	
Sharon, Pa.	
So. Chicago, Ill.	
So. San Francisco, Calif.	
Sparrows Point, Md.	
Trenton, N. J.	
Waukegan, Ill.	
Worcester, Mass.	

WIRE, Galv'd ACSR for Cores

Bartonville, Ill.	
Buffalo, N. Y.	
Johnstown, Pa.	
Monessen, Pa.	
Moline, Ill.	
Portsmouth, O.	
Roebling, N. J.	
Sparrows Pt., Md.	

ROPE WIRE (A)

Allen, Ill. (1)	
Bartonville, Ill.	
Buffalo, N. Y.	
Fostoria, O.	
Johnstown, Pa.	
Monessen, Pa.	
Moline, Ill.	
Palmer, Mass.	
Portsmouth, O.	
Roebling, N. J.	
Sparrows Pt.	
Struthers, O.	
Worcester, Ill.	

(A) Plow and Mild Plow; add 0.2c for improved plow.

WIRE, Tire Bead

Allen, Ill. (1)	
Bartonville, Ill.	
Monessen, Pa.	
Roebling, N. J.	

WIRE, Cold-Rolled Flat

Anderson, Ind.	
Buffalo, N. Y.	
Cleveland, O.	
Crawfordsville, Ind.	
Dover, O.	
Fostoria, O.	
Kokomo, Ind.	
Franklin Park, Ill.	
Massillon, O.	
Monessen, Pa.	
Palmer, Mass.	
Trenton, N. J.	
Worcester, Mass.	

WIRE, Merchant Quality

(6 to 8 gage)	Annld	Galv.
Ala. City, Ala. (2)		
Aliquippa, Pa.		
Atlanta, Ga.		
Bartonville, Ill.		
Buffalo, N. Y.		
Cleveland, O.		
Crawfordsville, Ind.		
Donora, Pa.		
Duluth, Minn.		
Fairfield, Ala. (2)		
Houston, Tex.		
Jacksonville, Fla.		
Johnstown, Pa.		
Joliet, Ill.		
Kansas City, Mo.		
Kokomo, Ind.		
Los Angeles, Calif.		
Minneapolis, Minn.		
Monessen, Pa.		
Palmer, Mass.		
Portsmouth, O.		
Rankin, Pa.		
So. Chicago, Ill.		
So. San Francisco, Calif.		
Sparrows Point, Md.		
Sterling, Ill.		
Struthers, O.		
Waukegan, Ill.		
Worcester, Mass.		

* Based on 1c zinc. ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.

Ala. City, Ala. (2)	
Ala. City, Ala. (2)	
Ala. City, Ala. (2)	
Aliquippa, Pa. (1), (4), (5)	
Atlanta, Ga.	
Bartonville, Ill.	
Crawfordsville, Ind.	
Donora, Pa.	
Duluth, Minn.	
Fairfield, Ala. (2)	
Houston, Tex.	
Johnstown, Pa. (2)	
Johnstown, Pa. (2)	
Joliet, Ill.	
Kansas City, Mo.	
Kokomo, Ind.	
Minneapolis, Minn.	
Monessen, Pa.	
Palmer, Mass.	
Pittsburg, Calif.	
Rankin, Pa.	
So. Chicago, Ill.	
Sterling, Ill.	

* Based on 1c zinc. ** Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

Ala. City, Ala. (2)	
Atlanta, Ga.	
Bartonville, Ill.	
Crawfordsville, Ind.	
Donora, Pa.	
Duluth, Minn.	
Fairfield, Ala. (2)	
Joliet, Ill.	
Kansas City, Mo.	
Kokomo, Ind.	
Minneapolis, Minn.	
Monessen, Pa.	
Palmer, Mass.	
Pittsburg, Calif.	
Rankin, Pa.	
So. Chicago, Ill.	
So. San Fran., Calif.	
Sparrows Point, Md.	
Sterling, Ill.	

WIRE, Barbed Col.

Anniston, Ala. (2)	
Aliquippa, Pa.	
Atlanta, Ga.	
Bartonville, Ill.	
Crawfordsville, Ind.	
Donora, Pa.	
Duluth, Minn.	
Fairfield, Ala. (2)	
Houston, Tex.	
Johnstown, Pa. (2)	
Joliet, Ill.	
Kansas City, Mo.	
Kokomo, Ind.	
Minneapolis, Ohio	
Monessen, Pa.	
Pittsburg, Calif.	
Rankin, Pa.	
So. Chicago, Ill.	
S. San Francisco, Calif.	
Sparrows Point, Md.	
Sterling, Ill.	

Based on 3c zinc. * 11c zinc. ** Subject to zinc equalization extras.

WIRE (16 gage)

	Annld Stone	Galv. Stone
Ala. City, Ala. (2)		
Aliquippa, Pa.		
Bartonville, Ill.		
Buffalo, N. Y.		
Cleveland, O.		
Crawfordsville, Ind.		
Fostoria, O.		
Johnstown, Pa.		
Kokomo, Ind.		
Minneapolis, Minn.		
Palmer, Mass.		
Pittsburg, Calif.		
Sparrows Pt., Md.		
Sterling, Ill.		
Waukegan, Ill.		
Worcester, Mass.		

* Based on 11c zinc. ** Subject to zinc equalization extras.

NAILS, Stock
To dealers & mfrs. (7)

	Col.
Alabama City, Ala. (2)	
Aliquippa, Pa. (1)	
Atlanta, Ga.	
Bartonville, Ill.	
Chicago, Ill.	
Cleveland, O.	
Crawfordsville, Ind.	
Donora, Pa.	
Duluth, Minn.	
Fairfield, Ala. (2)	
Galveston, Tex.	
Houston, Tex.	
Johnstown, Pa. (2)	
Joliet, Ill.	
Kansas City, Mo.	
Kokomo, Ind.	
Minneapolis, Minn.	
Monessen, Pa.	
Pittsburg, Calif.	
Rankin, Pa.	
So. Chicago, Ill.	
Sparrows Pt., Md.	
Sterling, Ill.	
Worcester, Mass.	

NAILS, CUT (100 lb keg)
To dealers (33)

Conshohocken, Pa.	
Wheeling, W. Va.	

STAPLES, Polished, Stock
To dealers & mfrs. (7)

	Col.
Alabama City, Ala. (2)	
Aliquippa, Pa. (1)	
Atlanta, Ga.	
Bartonville, Ill.	
Crawfordsville, Ind.	
Donora, Pa.	
Duluth, Minn.	
Fairfield, Ala. (2)	
Houston, Tex.	
Johnstown, Pa. (2)	
Joliet, Ill.	
Kokomo, Ind.	
Minneapolis, Ohio	
Monessen, Pa.	
Pittsburg, Calif.	
Rankin, Pa.	
So. Chicago, Ill.	
Sparrows Pt., Md.	
Sterling, Ill.	
Worcester, Mass.	

FENCE POSTS

	Col.
Chicago Hts., Ill. (2)	
Duluth, Minn.	
Johnstown, Pa.	
Minneapolis, Ohio	
Monessen, Pa.	
Pittsburg, Calif.	
Rankin, Pa.	
Sparrows Pt., Md.	
Sterling, Ill.	
Worcester, Mass.	

SEAMLESS STANDARD PIPE, Threaded and Coupled

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

BUTTWELD STANDARD PIPE, Threaded and Coupled

BOILER TUBES

Net base per 100 ft. prices, dollar per foot ft. mill, minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	—	15.02	13.41
1¼	13	—	22.33	18.12
1½	13	20.62	21.91	20.01
1¾	13	21.10	25.41	23.66
2	13	27.14	32.58	26.61
2¼	13	30.98	37.15	29.86
2½	12	33.14	40.32	32.41
2¾	12	36.82	44.11	35.70
3	12	39.87	48.09	38.66
3½	12	42.52	51.28	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee All No. 2	Rails 60 lb. Under
Bessemer Pa. T2	1.32½	1.22½	1.27½	—20
Ensley Ala. T2	1.32½	1.22½		—20
Fairfield Ala. T2				—20
Gary Ind. T2	1.32½	1.22½	1.27½	—20
Huntington W.Va. W7				—20
Indiana Harbor Ind. T2	1.32½	1.22½	1.27½	—20
Johnstown Pa. B2				—1.60—20
Lackawanna N.Y. B2	1.32½	1.22½		—20
Minnequa Colo. C10	1.32½	1.22½		—20
Steelton Pa. B2	1.32½	1.22½		—20
Williamsport Pa. S19				—20

TIE PLATES	
Fairfield Ala. T2	.125
Gary Ind. T2	.125
Ind. Harbor Ind. T2	.125
Lackawanna N.Y. B2	.125
Minnequa Colo. C10	.125
Pittsburg Calif. C11	.125
Seattle B3	.125
Steelton Pa. B2	.125
Torrance Calif. C11	.125

STANDARD TRACK SPIKES	
Fairfield Ala. T2	
Ind. Harbor Ind. T2	
Kansas City Mo. S6	
Lebanon Pa. B2	
Minnequa Colo. C10	
Pittsburg Calif. C11	
Seattle B3	
Chicago Hts. B2	
Youngstown O. Y1	
Youngstown B2	

TRACK BOLTS (20) Treated	
Cleveland B2	11.00
Kansas City Mo. S6	11.00
Lebanon Pa. B2	11.00
Minnequa Colo. C10	11.00
Pittsburg Calif. C11	11.00
Seattle Wash. B3	11.50

JOINT BARS	
Bessemer Pa. T2	.225
Fairfield Ala. T2	.225
Ind. Harbor Ind. T2	.225
Joliet Ill. C6	.225
Lackawanna N.Y. B2	.225
Minnequa Colo. C10	.225
Steelton Pa. B2	.225

AXLES	
Ind. Harbor Ind. S13	6.50
Johnstown Pa. B2	6.50

RIVETS

F.o.b. Cleveland and Chicago equalized with Pittsburgh, except as noted.

Structural 7/8 in. & larger, 5c lb. base.

Structural 3/4 in. & smaller, 10c lb. base.

Boiler, 5/8 in. & larger, 5c lb. base.

Boiler, 1/2 in. & smaller, 10c lb. base.

Extra for under carload lots, 1c lb.

WASHERS, WROUGHT

F.o.b. shipping point, in bbls.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

F.o.b. midwestern plants, per cent off list for case lots to consumers.

½ in. and smaller, ... & smaller diam., ... & larger diam.

Longer than 6 in., All diams.

Eye bolts, all diams., 6 in. and shorter, over 6 in. thru ...

Ribbed Necked Carriage, Barrel, Plow, Step, Elevator, Tap and Stove Bolts, Tire Bolts, Rivet & Bolting Cut Bolts

NUTS

H.P. & C.P. regular & heavy, Square, H.P. ... & heavy, C.P. Hexagon & Square, Hot pressed, ... & smaller, Finished Hex Nuts, Semi-finished & Tapped Hex, Regular and heavy

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam. & 6 in. and shorter, 1 in. and smaller diam. ... & smaller

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller, ... diam. & smaller, ... and larger

N.F. thread, all diams.

STEEL STOVE BOLTS

F.o.b. plants, per cent off list in packages

Plain finish, Tinned finish

HEXAGON CAP SCREWS

(100's, steel, packaged, per cent off list)

½ in. & smaller, ... in. Hannas, Lag, Lag and Shanked, Indirect Head, ... and larger, Square

METAL POWDERS

Footnotes

STAINLESS STEEL MILL PRICES

(Represented by prices, cents per pound, subject to current lists of extras)

AISI Type	Rerolling Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes, H.R. & C.F. H.R. Strip	Bars, Wire	Plates	Sheets	C.R. Strip, Flat Wire
301	16.25	20.50	26.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	28.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	36.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	38.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	38.75	48.75	43.75
304L			34.75			42.75	45.25	54.25	49.00
305	19.50	25.50		36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	28.25	35.25	40.75	38.00	42.00	46.00	55.25	45.00
309	26.50	34.75	43.25	49.25	50.50	53.75	63.50	72.25	62.00
309S	25.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	65.50
310	33.00	44.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314							69.00	74.50	
316	28.00	36.25	46.75	54.50	55.00	55.00	59.00	64.50	68.50
316L			52.50			61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	59.25	64.50	68.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	49.75	42.00	42.00	46.00	55.50	54.50
330			58.00			68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403			27.00	30.75		32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416			24.50	28.25		29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F		18.75	25.00	28.75		29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
410A B,C		28.00	29.25	34.00		35.00	38.50	49.25	52.75
442			28.00			30.50	35.25	48.25	47.75
446			33.75	38.25	53.00	36.50	40.75	59.75	71.00
501			14.00	14.50	21.25	16.00	18.25	80.50	29.00
502			15.25	16.00	22.25	17.00	20.00	81.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Roma Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Ageloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Fred Ullrich & Sons; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302		31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.60	42.00		144.00
316	32.80	37.70-42.75	42.75	
318	37.00	42.20		
321	28.80	34.40-37.00	37.00	111.00
347	30.40	35.60-40.50	40.50	130.00
405	23.40	30.60		
410	22.60	30.10		
430	22.60	30.10		
Inconel	41.23	54.18		165.00
Nickel	37.50	50.00		
Monel	38.00	61.80		
Copper*			46.00	

	Strip, Carbon Base Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*			46.00	

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. I-7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville I-7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.365	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.666-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20	4	1.5	12		3.875
18	4	1	4		2.180-2.330
18	4	2	9		2.515
18	4	2			1.640
18	4	1			1.480
13.5	4	3			1.735
6.4	4.5	1.9		5	1.005-1.055
6	4	3		6	1.240
2	1.4	1.2			0.498
1.5	4	1		8.5	0.885-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V8.

PIG IRON

Gross Ton F.o.b. furnace prices in dollars per gross ton, as reported to Steel. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City R2	52.38	52.38		
Birmingham R2	52.38	52.88		
Birmingham U6		52.88		
Woodward, Ala. W16	52.38	52.88	56.50†	
Cincinnati, del.		60.43		
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	
Tonawanda, N.Y. W12	56.00	56.50	57.00	
No. Tonawanda, N.Y. T9		56.50	57.00	
Boston, del.	66.65	67.15	67.65	
Rochester, N.Y., del.	59.02	59.52	60.02	
Syracuse, N.Y., del.	60.12	60.62	61.12	
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary, Ind. U5	56.00		56.50	
Indiana Harbor, Ind. I-2	56.00		56.50	
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	
So. Chicago, Ill. U5	56.00		56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.		62.80	62.80	
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00			57.00
Mid Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
New York, del.		62.28	62.78	
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50		
Steelton, Pa. H2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy, N.Y. R2	58.00	58.50	59.00	
Pittsburgh District				
New Kensington, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&H sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville, Brunot Island, Allmegding, Monaca, del.	57.66	58.16	58.16	58.66
Verona, Trafford, del.	58.19	58.69	58.69	59.19
Buckeridge, del.	58.45	58.95	58.95	59.45
Bowmont, Pa. U6	56.00		56.50	57.00
Clairton, Franklin, So. Duquesne, Pa. U5	56.00			
McKeesport, Pa. N8	56.00			57.00
Midland, Pa. C18	56.00			
Monessen, Pa. P7	56.00			
Youngstown District				
Hubbard, O. Y1			56.50	
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1			56.50	57.00
Youngstown U5	56.00			57.00
Mansfield, O., del.	60.90		61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.75	61.25	61.75	
Fontana, Calif. K1	62.00	62.50		
Geneva, Utah C11	56.00	56.50		
Granite City, Ill. G4	57.90	58.40	58.90	
Ironton, Utah C11	56.00	56.50		
Lone Star, Texas L6	52.00	52.50*	52.50	
Minnequa, Colo. C10	58.00	59.00	59.00	
Rockwood, Tenn. T3			56.50	
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26		

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$87.50
Keokuk, Iowa, Open hearth & Fdry., freight allowed K2	92.00
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.00
Wenatchee, Wash., OH & Fdry., freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. H2	64.00
Philadelphia, del.	64.00
Troy, N.Y. R2	64.00

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	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Boston	6.20	7.64	7.78	7.00		6.56	8.17§	12.04	6.98	6.85	7.98
Buffalo	6.10	7.00	8.00§	6.30		6.15	8.50		6.35	6.35	8.25
Buffalo	6.65	7.85	9.18	7.13		6.87	8.35	12.13	7.06	7.13	8.26
Buffalo	6.15	7.15	8.70	6.79		6.55	7.70	12.02	6.59	6.68	7.88
Charlotte, N. C.	6.85	7.80	8.65	6.90		7.10	8.37		7.10	7.10	8.37
Chicago	6.15	7.12	7.95	6.42		6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati	6.20	7.11	8.20	6.66		6.52	7.60	11.85	6.64	6.62	7.71
Cleveland	6.15	7.12	7.90	6.58		6.34	7.40	11.74	6.79	6.50	7.63
Detroit	6.38	7.29	8.22	6.60	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.15	7.15	8.15	6.35		6.23	7.50§		6.50	6.36	7.79
Houston	7.15	7.60	9.23	7.45	9.30	7.45	9.30		7.35	7.20	8.55
Los Angeles	8.25	9.00	9.35	7.50	11.20	7.15	9.10	13.10	7.38	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59		6.44	7.57	11.77	6.63	6.50	7.63
Moline, Ill.	6.51	7.47	8.35	6.77		6.61	7.85		6.81	6.68	
New York	6.75	7.52	8.37	7.16		7.06	8.43§	11.99	6.90	6.99	8.30
Norfolk, Va.	6.90			7.00		7.00	8.50		7.00	7.00	7.85
Philadelphia	6.35	7.13	7.87	7.02	8.80	6.87	8.19§	11.74	6.67	6.63	7.66**
Pittsburgh	6.15	7.12	8.00	6.55		6.28	7.65	11.60	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65		7.35	10.65		7.25	7.30	9.15
Richmond, Va.	6.80		8.67	7.10		7.05	8.20		7.10	6.85	8.20
St. Louis	6.6	7.42	8.25	6.72		6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08		6.94	8.06		7.12	6.99	8.12
San Francisco	7.35	8.20	9.30	7.60		7.15	9.75	12.90	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00		7.60	10.65	13.50	7.50§	7.60	9.40
Spokane	8.15	9.40	9.80	7.60		7.60	10.55§	14.15	7.25	7.35	9.40
Washington	6.71	7.65	8.35	7.51		7.37	8.43		7.49	7.36	8.49

*Prices do not include gage extras. †Prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded). ‡Includes 35-cent special bar quality extra. §as rolled. **⅝-in. and heavier, add 0.3¢ for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb. †500 to 9999 lb; §1000 to 1999 lb; *1000 lb and over; †1500 lb to 3999; §under ½ in.

Warehouse Competition Grows Keener

Distributors seek orders as demand falls substantially below the rate a year ago. Price levels are maintained but considerable freight is being absorbed

Cleveland Warehouse operators are competing actively for orders. With volume down noticeably from a year ago, and stocks in the best shape they have been in several years, the distributors are out digging for business which isn't coming to them like it was when supplies were short and manufacturing operations on a higher level than at present. Building steel is moving at a faster clip currently, but manufacturers' requirements are lagging. In the main, warehouse prices are steady, but freight is being absorbed. Competition from seconds is severe, especially in the flat-rolled category.

Philadelphia Most steel warehouses here look for April business to be on a parity with that in March. Little noticeable change is seen for May. Trading is down substantially from a year ago.

New York Warehouse sales are highly competitive, notably on products where warehouse distribution is high, wire nails, pipe, tubular products and galvanized sheets. Nail volume approximates that of last year, but the profit margin is lower. Pipe sales are slower, with prices 17½ points off list frequently. Distributors are liquidating inventories slowly. Many former warehouse buyers are ordering from mills, placing small lots formerly classed as warehouse size. Distributors are not buying except for needed replacements.

Pittsburgh Sales are on even level, with improvement in number of incoming orders but low volume to the average order. Sheet sales are disappointingly weak. Movement of bars and tubular products is slow, but distributors report activity in plates and structural shapes.

Boston Warehouse distributors are more concerned in getting steel inventories down than in replacements. Consequently orders placed with mills are meager. Usual warehouse distribution in this area is somewhat above the national level.

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM A 305	$4.55	$4.55	$4.50	$4.83
Bar Size Angles	4.40	4.40	4.35	4.68
Structural Angles	4.40	4.40	4.35	4.68
I-Beams	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt./Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	29	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅜ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries

approximately 18.50 per cent of all steel shipped, 1953. While there is some slight improvement in steel required for building, industrial demand is confined to numerous small orders with little change in total tonnage. Average warehouse stock is generally higher relatively than direct consumer manufacturing inventories.

Cincinnati. Distributors miss the big orders which they received prior to the inventory recession. Stocks are in balance, with all items in good supply. Prices are unchanged.

Chicago. Steel warehouses continue to scan orders with the hope of discerning future business weather. So far there is little of definite character, either of consuming groups, geographical area or product nature. Orders are holding steady and are well distributed.

Los Angeles. Warehouse steel activity is up 15 to 20 per cent from the January-February levels. Inquiries are more numerous and distributors are more confident a definite upturn in business is under way.

San Francisco. Warehouses have well rounded inventories, but they are not carrying excessive stocks, knowing they can get fast delivery from mills.

Seattle. While April volume is not up to expectations, it shows an increase over March. Sentiment is optimistic in spite of spotty current business. Threats of strikes by machinists and boilermakers, which it was feared would tie up many jobs, appear to have passed. Warehouses report normal inventories but they are now in position to carry more bread-and-butter items. Quick mill delivery is also a favorable factor. The price structure is stable here but in Portland territory prices continue upset.

Tin Plate . . .

Tin Plate Prices, Page 140

Pittsburgh. With orders growing, one district tin mill operated at close to 90 per cent of capacity last week. Outlook for second quarter is bright. Producers are cutting into tin plate stocks accumulated at their mills.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 138

Seattle. Rolling mill operations are steady but backlogs are shrinking. Small tonnages are fairly numerous but awards of several sizable reinforcing bar jobs are still pending. Considerable tonnage is expected to be placed shortly.

Sheet Steel Consumption Tops Sales

Fabricators are reducing inventories gradually and are increasing their purchases slightly. Further pick-up in demand is expected next month

Sheet and Strip Prices, Page 138 & 139

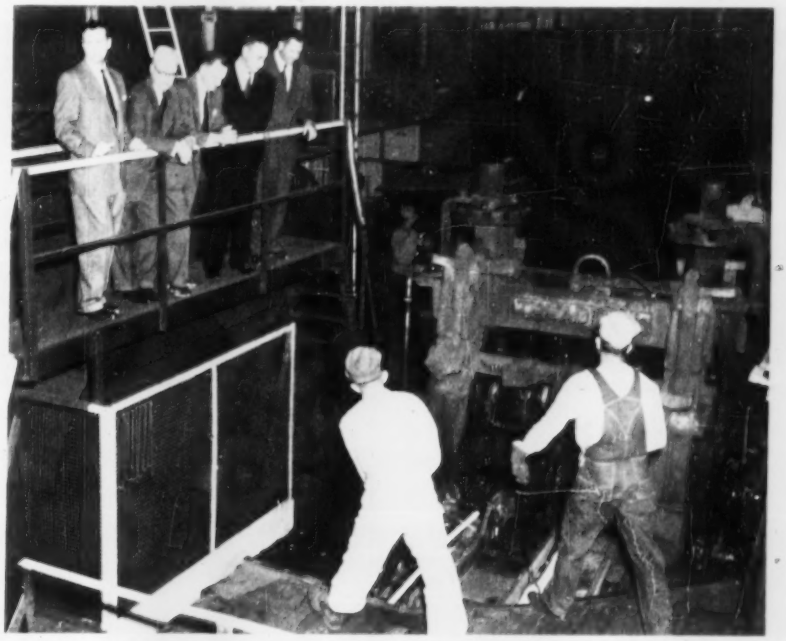
New York. Much more sheet tonnage is being consumed than bought. Order volume is creeping up slowly despite the fact inventories generally are still heavy, though not as heavy as they were. Contributing to current buying is the necessity for filling in various sizes.

Many consumers were fairly deluged with tonnage from the mills late last year and in the early part of this year. In the main, these tonnages were accepted for the partial reason many buyers hadn't yet got used to a free supply. Certain consumers actually had to employ outside facilities to store the tonnage they were receiving from the mills.

In the closing weeks of last year and the first two months of this year some took in enough tonnage to meet their normal requirements for many weeks into the future. However, such cases were the exception, and while inventories generally will continue to be a problem for sellers, stocks are steadily being whittled down.

Indications are most sheet metal fabricating companies here are operating on a full 40-hour week. Manufacturers of office furniture, shelving, cabinets of one description or another and stoves are all fairly busy. Manufacturers of air conditioning equipment are busy. This means substantial consumption of cold-rolled sheets for air conditioning units, and there is much going on in the way of installation of air conditioning and ventilating systems, which means a lift in demand for galvanized and hot-rolled carbon sheets, as well as cold-rolled material.

Boston. While sheet and strip orders vary from day to day, slight improvement in May volume is predicated on fill-in tonnage. Consumption



Porter Executives Visit Birmingham Plant

Executives of H. K. Porter Co. Inc. and subsidiaries recently inspected facilities of Connors Steel Division, Birmingham, which operated at virtual capacity in the first quarter. Those shown above, left to right, are H. T. Montgomery, general sales manager, Connors; R. F. Allen, assistant to the executive vice president, Porter; B. Campbell Blake, vice president, general manager, Connors; C. R. Dobson, executive vice president, Porter; J. B. Reeves, works manager, Connors

is lower than last year, but in many cases users have been working off more tonnage than they have bought over the last three months. Consumers are extremely cost conscious. Ratio of slit sheets, wasters and rejects is relatively high at the expense of prime material.

Demand for stainless, 430 grade, for automotive use is slightly heavier. Also, mild pick-up in 300 series for industrial use, substituting for 400 grades now depleted, is noted. Some will continue to use the 400 series and not return to the higher nickel. For some time it has been clear that the 400 series stainless inventories were much higher starting this year than estimated.

Some automobile tag tonnage, hot-rolled pickled, is coming out. New Hampshire needs went to Youngstown Sheet & Tube Co., and Rhode Island's to Dolan Steel Co., Bridgeport.

Philadelphia—Cold-rolled sheets are in most active demand in the flat-rolled category. Galvanized sheets also are moving well.

Cleveland—Substantial volume of second quarter sheet tonnage is being booked by the mills but they can accommodate additional tonnage without difficulty. Demand is slightly better than a month ago from some consuming outlets, and producers are confident further pickup will be experienced as the quarter advances.

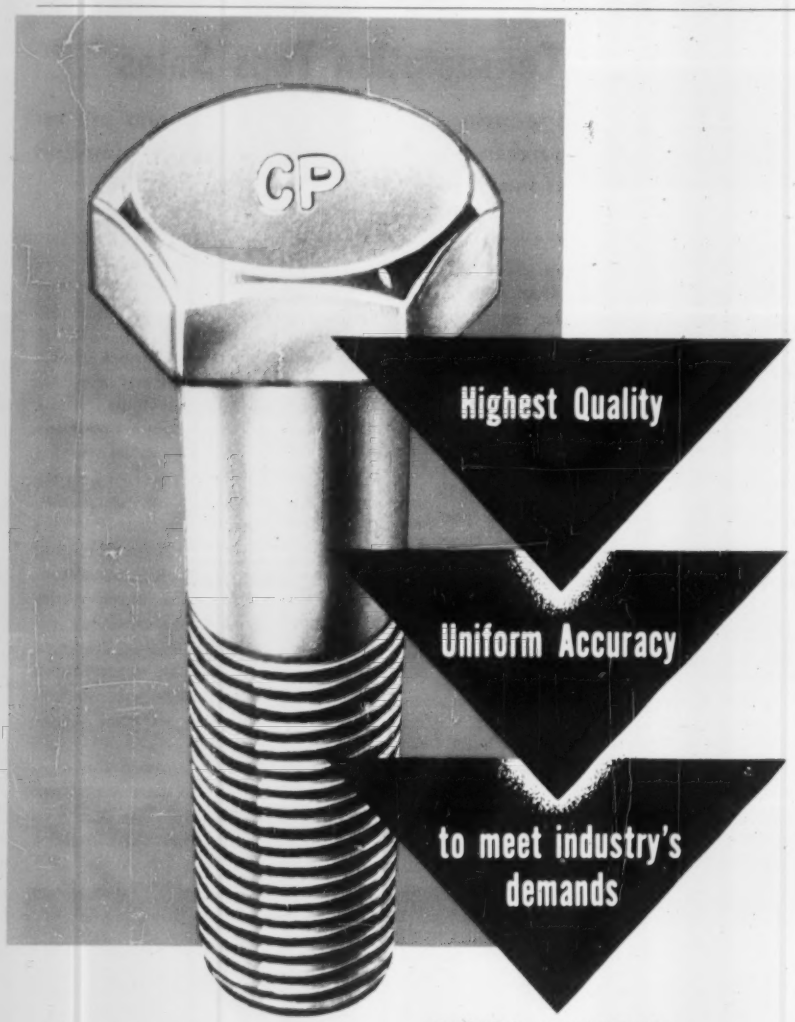
In the main expectations are the going will continue rough and competition keen for some time into the future since consumer and warehouse inventories, while down, still are a factor to contend with. Further, cautious buying by users still rules.

Mill base prices are firm but freight absorption is being met. Reported waiving of certain extras is denied by the mills.

Chicago—Last week's $22 million grain bin award by the Agriculture Department guarantees steady output of galvanized sheets for a while. This product has been holding in steady demand. A producer here lists galvanized in the 10 to 12 weeks shipment category, an extension of 2 weeks from a month ago. Cold-rolled sheets and strip remain at 4 to 5 weeks; hot-rolled, 3 to 4 weeks.

Pittsburgh—With no increase in sheet demand expected for the next month, producers anticipate steady sales. Small fabricators report a growing number of customers have completed inventory adjustment.

Los Angeles—Rising demand for flat-rolled steel products is noted. Sheetmakers' shipments are 5 per cent greater than in March, and 12 per cent above the February rate.



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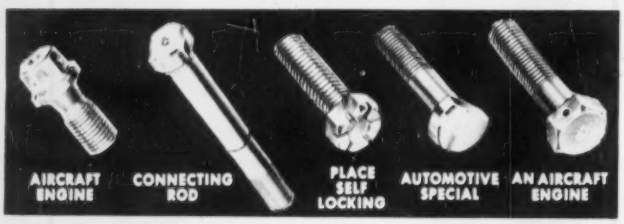

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Steel Bars . . .

Bar Prices, Page 138

Cleveland—Buyers continue to order merchant bars cautiously, but demand appears to be a little better than it was a month or so back. Buying is being closely held to needs, prompt shipment orders coming to producers indicating fill-in tonnage is needed on a somewhat larger scale.

This type buying reflects continued liquidation of consumer inventories more than it does a pickup in consumption, in the opinion of some sellers here. Bar inventories were much larger than had been estimated at the turn of the year. The cutbacks in military requirements have complicated the situation. Apparently they have resulted in even larger inventories than would have been the case had not consumers frantically taken in everything they could in the form of bars last year to assure adequate supplies for defense work.

New York—Hot carbon bar business is spotty, with domestic producers encountering increasing competition along the seaboard from foreign sellers. Foreign offerings, in some cases, undercut the domestic market by as much as $20 a ton.

Larger users are knee-deep in stocks and are buying sparingly, such as is necessitated by need for filling in on certain sizes urgently required.

At the same time mills do not seem quite as eager for tonnage as a few weeks ago. There appears to be a greater disposition among producers to wait for a greater accumulation of sizes, probably because they find lower costs resulting make it worth while. This is reflected in part by a little more extended delivery promises on an average. Should this trend continue for any length of time it may have a stimulating effect on orders as buyers become convinced they can no longer get the rush shipments.

Cold drawers are experiencing more activity, relatively, than the hot mills. Warehouse specifications, they report, have definitely picked up and direct manufacturing consumers of cold bars are showing more interest. While there is not the military tonnage of some months ago, business of this nature is still coming out. Last Monday, the Navy Procurement Office, Washington, closed bids on 850 tons of bessemer stock (C 12-13) for shell components for shipment to Macon, Ga.

One cold drawer reports a shift in wire size deliveries to around four to six weeks now as compared with

NEW!

BART LECTRO-CLAD NICKEL CLAD

for fabricating into products demanding corrosion and contamination control.

Nickel plated on either or both sides by the electro deposition of pure nickel which provides a permanently bonded, ductile and pore-free cladding up to .020" thick. Produced with a new plating technique developed by BART MANUFACTURING CORPORATION and now available in sizes up to 7 feet x 20 feet.

★ LECTRO-CLAD Plate and Sheet suitable for fabrication into all types of storage tanks, chemical processing vessels and other equipment and installations where corrosion or contamination problems exist.

★ THICKNESS OF CLADDING can be supplied to particular requirements and not necessarily governed by the thickness of the steel plate over which it is applied.

★ ALL RELATED WELDING techniques perfected. No special equipment required.

★ LECTRO-CLAD Plates and Sheets withstand heating, forming, bending and other fabricating processes without change.

Write to Dept. S 4 for details.

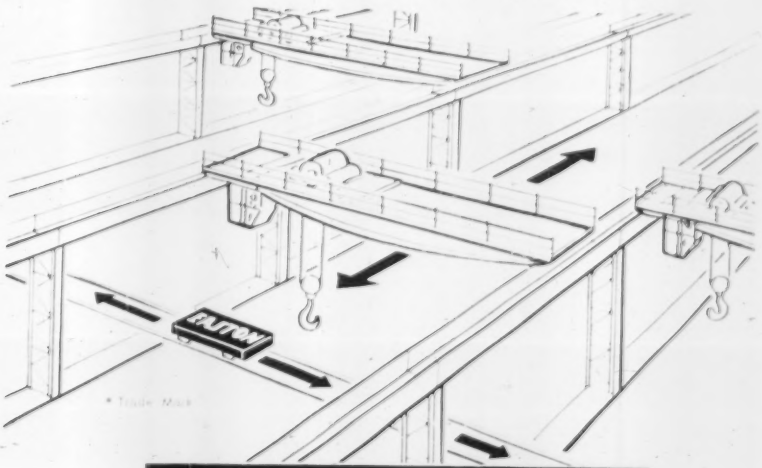
LECTRO-CLAD PLATE is the direct outgrowth of the successful patented BART PROCESS for nickel-lining of seamless steel pipe and fittings.

BART LECTRO-CLAD

BART MANUFACTURING CORPORATION
229 Main Street • Belleville 9, New Jersey
Exclusive territories available to qualified distribution organizations

Cross-Bay Transfer

Automatic motor-driven transfer cars provide a universal handling system in modern parallel bay plants now served by overhead cranes. Also for transfer between plant buildings.



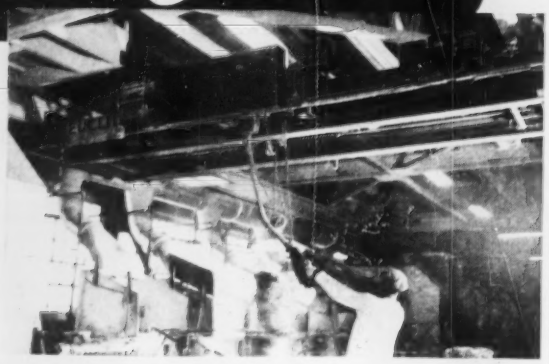
A 1041

EASTON

EASTON CAR & CONSTRUCTION COMPANY · EASTON PA. · NEW YORK · PHILADELPHIA · PITTSBURGH

Correct Control

will utilize MAXIMUM CRANE EFFICIENCY



Equally important to the physical structure of a crane is the type of control that governs its movements.

Selection of the correct control is, therefore, governed largely by the type of business, the kind of building in which it is to be installed and the specific nature of the product manufactured.

Whether a purchaser gets maximum service and efficiency from his crane will be determined to a great extent by the soundness of advice given him in this regard.

The counsel of EUCLID engineers, based on a long period of specialized experience, is available to all without obligation. We'll be glad to confer with you.

Euclid Cranes

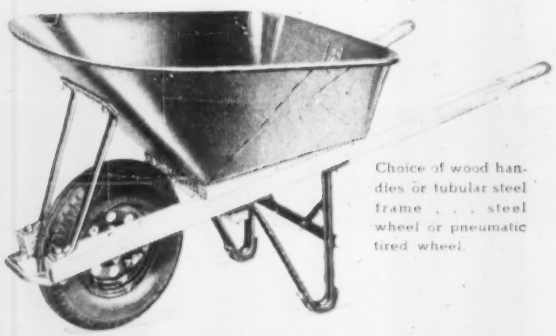
The EUCLID CRANE & HOIST Co.
1365 CHARDON ROAD
EUCLID, OHIO

a SAFE Bet!

You're sure to win with these easy wheeling Sterling barrows. Why? Because Sterlings are made to outlast any barrow on the market. Sterlings are engineered and built to take hard punishment, over a long period of years. That's why they cost less. Get the facts. Write for Catalog No. 63A.

STERLING C5W

Maximum capacity 5 cu. ft. 16 gauge tray, all welded, no rivets double lapped at corners. Heavy duty malleable wheel guard.



Choice of wood handles or tubular steel frame . . . steel wheel or pneumatic tired wheel.

DEALERS:
Write for Our Non Exclusive Selling Plan.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

a couple of weeks a month or so ago. This is particularly true of sizes ranging 3/16 to 5/8 inch. Cold alloy bar shipments also are somewhat more extended and this reflects in part more extended promises by the hot alloy producers. Whereas these producers could promise three weeks shipment a relatively short time ago, and probably still can in some cases, the average now is more around four weeks. Cold drawers, where they haven't the hot material in stock, are promising five to six weeks.

Boston—Drop in defense contracts has hurt alloy bar volume, but some attractive tonnage is in the making for armament work, notably stainless, parts for a small arms contract held by one Worcester shop. Additional gun barrel bars are needed for the Biddeford, Me., rifle assembler, also shell steel for New Bedford. Forge shops have lost more defense tonnage and some civilian work.

On both hot and cold-rolled carbon bars, producers are booked deeper into May than they were for April in late March. Bolt shops are subjected to heavy discounts on more standard grades. For more suitable profit-margin the trend is steady toward bolt and nut specialties.

Pittsburgh—General slow-up in sales is expected to continue well into second quarter, as buyers postpone purchases of farm equipment or appliances. April will probably be the lowest month this year from a sales standpoint, with slight improvement next month. Alloy barmakers say customers specify quicker delivery. This indicates they may have dropped inventories to the lowest possible level.

Chicago—Orders for bars provide no clue as to future demand or any consuming field that is planning on increased activity. Commitments are mostly for May delivery with few beyond June. However, perhaps of some significance is the fact that rush orders are becoming more numerous.

Los Angeles—Bar demand shows great improvement. Requirements are more pressing and users are specifying more heavily. Bethlehem Pacific Coast Steel Corp.'s deliveries are current with demand.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 141

Pittsburgh—Demand for all types of fasteners continues in the doldrums. Production averages about 30 per cent below last year. Sales are improving slightly to construction industries, but warehouses and railroads are buying at low rates.

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C 1039 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 90,000 p. s. i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C 1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned, flat and chamfered. Tensile strength in accordance with SAE Grade 5. Carried in stock.

"LO-CARBS"

Made of AISI C 1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength in accordance with SAE Grade 2. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard, polished if specified — threads soft to close tolerance — points machine turned, flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

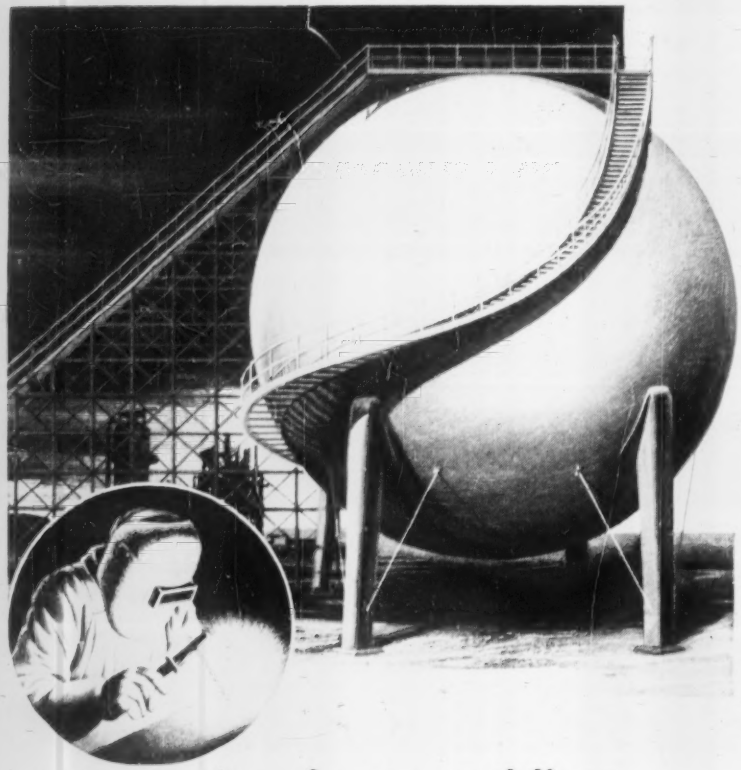
Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

SPECIALS furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES



For **easier, faster welding**
use one electrode for all positions

Gas or liquid retaining hortonspheres are welded in the field. In the process, every welding position is used — downhand, vertical and overhead. Today, because *one electrode* can produce sound weld metal from every position, considerable time is saved by eliminating frequent electrode changes.

You can profit from this same advantage by using Arcos Low Hydrogen Electrodes for welding high tensile steels. With few exceptions, once you select the proper electrode, you can keep on welding with *one electrode* — no need to change electrodes for different welding positions. Besides saving time, inventory can be simplified.

ARCOS GRADE	A. W. S. SPEC.
Tensilarc 70	E7018
Tensilarc 80	E8018
Tensilarc 100	E10018
Manganarc 1M	E9018
Manganarc 2M	E10018
Nickarc 2	E8018
Chromarc 1M	E8018
Chromarc 2M	E8018

Arcos quality controls, highest in the industry, assure you dependable, uniform weld metal for every application. Write for "The ABC's of Welding High Tensile Steels".

ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Penna.

WELD WITH ARCOS
LOW HYDROGEN ELECTRODES

Wire . . .

Wire Prices Page 110

Boston—Finishing operations are 10 to 15 points higher than the ingot rate and rod production with most integrated wire producers. Nonintegrated mills are drawing more rod tonnage than they are buying. Slight improvement in new orders is maintained, although prompt delivery is sought for current production.

Wire for nails is more active, but demand for spring wire is hardly 70 per cent of that last year, while cold heading wire is close to 30 per cent lower than in second quarter, 1953. Specialties, alloys and stainless, are recovering slower than the more common carbon grades. Screw shops are operating on reduced schedules, four days at best.

New York—While slightly improved to some extent, more consumers are filling gaps in inventories. Carbon wire orders are for prompt shipment. Buying is mostly for replacement and geared closer to consumption. Once inventories are worked down, consumers plan to carry less steel in stock, balance for 30 to 45 days. Incoming stock and a wide range of specialties, including automotive, are affected. In the case of specialties, stocks of finished fabricated goods are a factor in conservative current buying.

Plates . . .

Plate Prices, Page 138

Chicago—Sheared plates are one steel product which is not available for quick delivery. A district producer lists them unchanged in the 9 to 10 week category. Universal mill plates, on the other hand, can be had in 3 to 4 weeks, but they are tightening somewhat since a month ago when they could have been had in 1 to 2 weeks.

Boston—Most carbon plate orders are for specific fabricating jobs. Buying for inventory is light. Plate shops can get shipment in two weeks and a substantial part of shipments is by truck.

This type of business is slightly heavier, notably for tanks. Massachusetts Engineering Co., Inc., has substantial backlog for airfield base fuel storage tanks. Despite large increase in petroleum storage capacity, additional tanks are building, Tiverton, R. I., and Chelsea, Mass., Gulf Oil Corp., and The Texas Co., Burlington, Vt.

Orders for heads are up slightly and deliveries have improved to three weeks. Clad steel is available in seven

weeks and no freight is being absorbed on carbon or floor plate.

New York—While plate buying is far from active, it is beginning to stir a little. Despite substantial inventories, warehouses and consumers are coming into the market for some sizes. However, they are doing little more than that, as they can get early shipments from producers. There is no building up of stocks for the future. Orders appear to apply only to immediate needs. That this situation is not going to continue indefinitely, though, is indicated by the fact fabrication is in excess of buying, notwithstanding profound dullness in specifying of plates for the shipbuilding and railroad industries. Some producers anticipate a slow but fairly steady gain in orders over the next few months, with appreciable increase by early fall.

Philadelphia—Plate production in this district is scheduled for improvement this week with the return to operation of the 160-inch mill at Claymont, Del. This mill has been down over the past month for repairs.

Pig Iron . . .

Pig Iron Prices, Page 112

Boston—Seasonal improvement in pig iron is drab. Malleable grades are moving in slightly better volume compared with No. 2 foundry, not because of heavier melt, but due to the fact more malleable is included in gray iron shop mixtures. Foundries are buying practically no tonnage for inventory. Basic iron requirements are slack. Bridgeport, Conn., steelmaker is not melting any pig iron, producing hot metal from scrap.

New York—Pig iron business shows little change from a month ago. Some sellers question if May volume will show appreciable improvement. Some, in fact, are beginning to talk about the probability of no important upswing before late summer.

District consumers are experiencing no pick-up in demand for castings nor do they see any definite signs of a pick-up soon. Meanwhile, most foundries are holding comfortable pig iron inventories, and where their stocks are getting low, they are showing no particular concern for the reason they can obtain quick deliveries from furnaces.

Philadelphia—Foundry pig iron business is moving ahead on a restricted basis, but the pace of demand is slightly improved. In addition to pipe mills the jobbing foundries are operating a shade better.

Cleveland—Merchant pig iron de-

When high operating pressures call for ***strong welds . . .***

Arcos stainless electrodes can deliver top-performing weld metal for high-pressure jobs—as well as others—because the specific qualities needed are "built in" every electrode. Arcos makes many electrodes for all kinds of jobs—each requiring a different balance of physical, chemical, or metallurgical properties. But, no matter how varied the requirements, Arcos electrodes will meet every one—consistently—yielding in the flash of an arc the highest grade weld metal available today.

For more information about specific applications of Arcos quality-controlled stainless electrodes, send for booklet, "What Electrode Would You Use?"

ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pennsylvania

WELD WITH ARCOS

STAINLESS ELECTRODES

ORES–COKE–REFRACTORIES

Prices as reported to STEEL, changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld E. Pa.

Foundry and basic 56-62% concentrates	
* contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish, basic, 60 to 68%	$ 20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68.69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign, Wolframite, good commercial quality	23.00-24.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account, 46.47%, $0.99-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb. Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High Heat Duty: Pueblo, Colo., $88; Ashland, Glade, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Oviston, West Decatur, Pa., Bessemer, Ala., Parker, Mexico, Mo., St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa.	$129.70
Johnstown, Pa.,	$140
Clearfield, Pa.,	$148.50
St. Louis,	$151.80
Athens, Tex.,	$155

Nozzles

Reesdale, Pa.,	$223.60
Johnstown, Pa.,	$229.20
Clearfield, Pa.,	$241.40
St. Louis,	$247.10
Athens, Tex.,	$247.70

Runners

Reesdale, Pa.,	$174;
Johnstown, Pa.,	$177.80;
Clearfield, Pa.,	$185.50;
St. Louis,	$187.30;
Athens, Tex.,	$191.80.

High Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Marion, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk, Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld	*26.00
Chicago, ovens	24.50
Chicago, deld	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld	28.12
Cincinnati, deld	25.85
Painesville, O., ovens	25.50
Cleveland, deld	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	*24.00*
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis deld	26.60
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld	26.62
Detroit, ovens	25.50
Detroit, deld	26.50
Buffalo, deld	28.08
Flint, deld	28.23
Pontiac, deld	27.96
Saginaw, deld	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, 5one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 72.5%, $41; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed, f.o.b. plant)

GRAPHITE

Diam. Inches	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.85
40, 35, 30	110	8.85
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	*8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

mand continues restricted and with spotty foundry operations still prevailing sellers do not anticipate much change in market conditions over the near future. Furnace stocks are adequate to meet the prompt requirements of customers and this makes for little incentive on the part of consumers to build inventories. Current show of returning strength in the scrap market is seen as favorable for iron in view of the wide gap in prices between pig iron and scrap in recent months.

Cincinnati—Automotive foundries are more active, some moving up to a 5-day week. Foundrymen, generally, are not looking for any prolonged increase in business as vacation time will be coming soon. Pig iron demand is expected to increase as scrap prices move upward.

Youngstown—Jeannette blast furnace at the Brier Hill Works of Youngstown Sheet & Tube Co. has been blown out for relining and will be down about 30 days. The company is using its own labor so far as possible in making the furnace repairs.

Chicago—Gray iron jobbing foundries are operating more or less hand-to-mouth and therefore on irregular basis. Backlogs are light and the mails are relied on heavily for new orders for castings and releases under contracts. Pig iron and other raw materials are ordered as required, some for rush delivery since low inventories are being maintained. Active blast furnaces in the district continue at 29 out of 43.

Iron Ore . . .

Iron Ore Prices, Page 151

Cleveland—Lake iron ore consumption increased slightly in March, totaling 5,931,800 gross tons against 5,786,725 the preceding month, reports the Lake Superior Iron Ore Association. In March, last year consumption amounted to 8,257,312 tons.

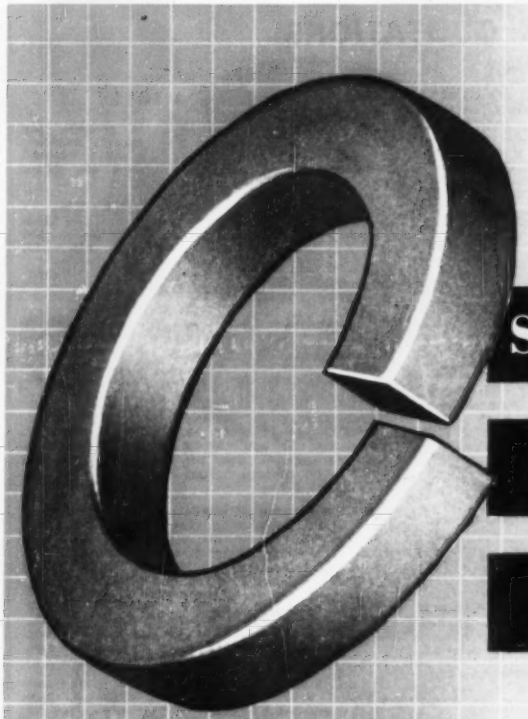
Consumption in the first three months this year amounted to 18,714,146 gross tons, comparing with 23,945,891 in the like period of 1953.

Stocks of ore on Lake Erie docks and at furnaces on Apr. 1 totaled 30,587,462 gross tons, reports the association. This compares with 36,385,842 tons on Mar. 1, and with 22,064,976 tons on Apr. 1, 1953.

On Apr. 1 idle blast furnaces numbered 58 in the U. S. and 6 in Canada. This compares with 51 and 6, respectively, on Mar. 1, and with 27 and 3, respectively, on Apr. 1 a year ago.

The largest cargo of taconite iron ore pellets to be shipped on the Great

(Please turn to page 159)

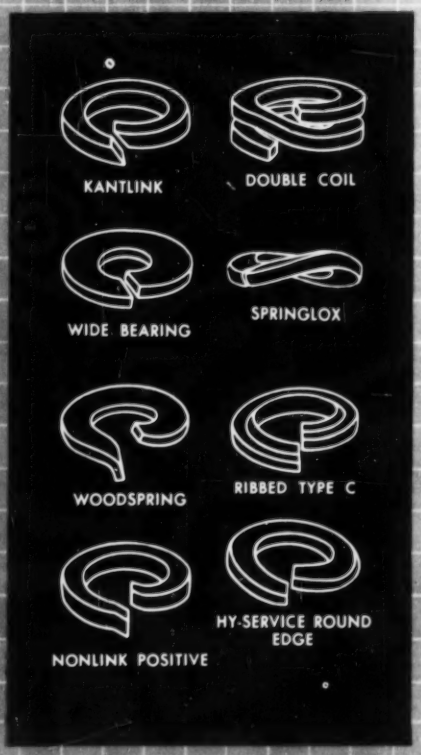


Reliance

SPRING LOCK WASHERS

Keep Bolted Assemblies

Tighter Longer



Reliance Spring Lock Washers are designed and manufactured to combat the natural enemies of bolted assemblies; i.e., vibration, shock, twist, wear, expansion, contraction and bolt elongation. It is little wonder, therefore, that you find Reliance Spring Lock Washers on everything from toasters to tanks, from lathes to locomotives. They are specified by designers and production men because of the non-fatiguing properties of the cold drawn spring steel. Their helical coil design also provides maximum reactive tension with a wide range of reaction. Reliance Spring Lock Washers help create more confidence in your product because they help keep bolted assemblies **tighter longer.**

SEND FOR ENGINEERING FOLDER W-50

Special Message to Distributors

We are looking for distributors to handle the Reliance Spring Lock Washer line. If you are interested in a product with a profit potential and wide acceptance, backed up with national advertising, write for more information today.

RELIANCE DIVISION EATON MANUFACTURING COMPANY

OFFICE and PLANTS: 514 Charles Ave., S. E., MASSILLON, OHIO

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

CURRENT FERROALLOY QUOTATIONS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 2-3% Si) Carlot per gross ton $56, Palmerton, Pa.; $57 Clairton and Duquesne, Pa.

(16% to 19% Mn): $54 per ton, Palmerton, Pa.; $55 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala., and Portland, Oreg.; add or subtract $2.00 for each 1% of fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low Carbon Ferromanganese, Regular Grade: (Mn 85-90%, Carload, lump, bulk, max. 0.07% C) 27.95c per lb of contained Mn, carload packed 28.5c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices; 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.00c to the above prices. Spot, add 0.25c.

Medium Carbon Ferromanganese: (Mn 80-85, C 1.5% max) Carload lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload lump, bulk, 36.2c per lb of metal, packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%) Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max) Contract, ton lots, 2" x D, $1.50 per lb of contained Ti, less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max) Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 3c.

Ferrotitanium, High Carbon: (Ti 15-18%, C 6.8%) Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2.4%) Contract $193 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High Carbon Ferrochrome: Contract, C.l. lump, bulk 24.75c per lb of contained Cr, c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.70c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. M x D, bulk 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.60c, less ton 30.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54% Si 28-32%, C 1.25% max) Contract, carload packed 8 M x D, 18.35c per lb of alloy, ton lot 19.2c, less ton lot, 20.4c, delivered, spot, add 0.25c.

Prices are repeated to steel.

Low Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-47%, C 0.06% max) Contract, carload, lump, 1" x down and 2" x down, bulk 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 2" x 8" per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant, freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x 1", packed, max 0.50% carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade; add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 39-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c; freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.75c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.45c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe), C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, less ton lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-45%, Fe 40-45%, C 0.20% max) Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.3c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max) Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.95%). Ton lots, 45c per lb, smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.00c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.4c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.4c. Packed c.l. 7.25c, ton lot 8.05c; less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $9.5o per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 9-11%) C.l. packed 16.6c per lb of alloy, ton lots 18.10c, less ton lots 19.30c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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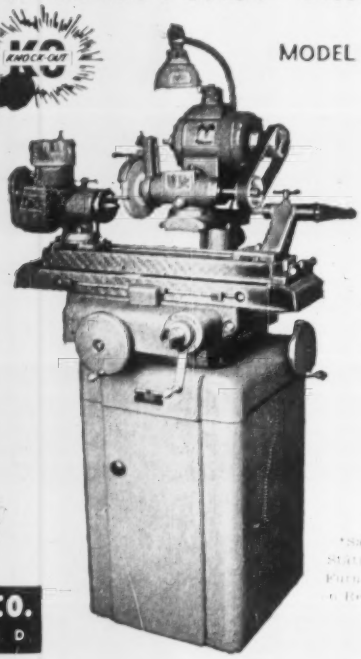

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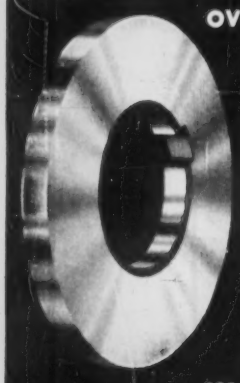

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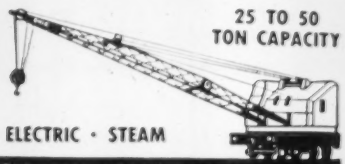

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(Concluded from page 154)

Lakes, 18,000 tons, arrived at Toledo, O., last week. The tonnage is for shipment to Armco Steel Corp. The pellets, running 63 per cent iron, were processed at the Reserve Mining Co.'s plant in Babbitt, Minn.

Birmingham The new ore-handling plant of U. S. Steel Corp. at Mobile, Ala., was opened recently when an Italian freighter unloaded 10,500 tons of iron ore from Peru. Three additional cargoes are enroute to the port. Initial shipment moved to the Tennessee Coal & Iron Division, U. S. Steel, on cars especially built for the purpose. Work on the ore handling facility started soon after U. S. Steel acquired Cerro Bolivar, its Venezuelan ore property.

Tubular Goods . . .

Tubular Goods Prices, Page 151

Pittsburgh — Mills producing oil country goods may operate close to capacity most of this year, and sales of other seamless products are improving. April promises to be the best month this year to date saleswise. Low demand from warehouses causes much of the slowness in the market. Buttweld sales remain dull.

Structural Shapes . . .

Structural Shape Prices, Page 138

Boston Airfield base construction includes contracts placed for 627 tons, hangars, with approximately 4000 tons pending for buildings, mostly shops and warehouses. Private construction estimating is down, but holds for schools and other educational buildings. State bridge inquiry is ahead for this year.

New York Structural steel activity has leveled off. Less new work is coming out and awards are somewhat scattered. However, some leading fabricators regard the lull as temporary pointing to considerable work in the planning stage. Leading local award involves 2775 tons for an apartment on Fifth Ave. at Eighth St.

Pittsburgh Plate demand from heavy construction companies and freight car builders is spotty. Highway construction continues brisk. Structural fabricators report inquiries coming in rapidly.

Seattle Demand for structural shapes is potentially strong, several sizable projects being scheduled for early action. These include state highway jobs and public works. Largest pending is the Larson Field hangar, Washington state, 2300 tons, bids in.

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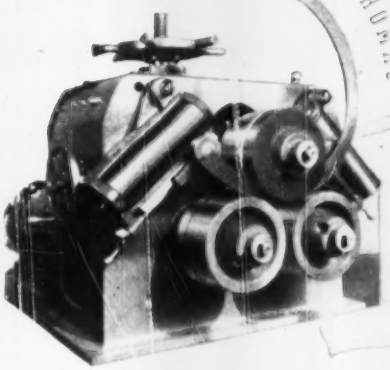

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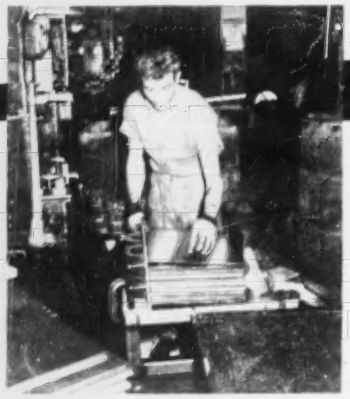

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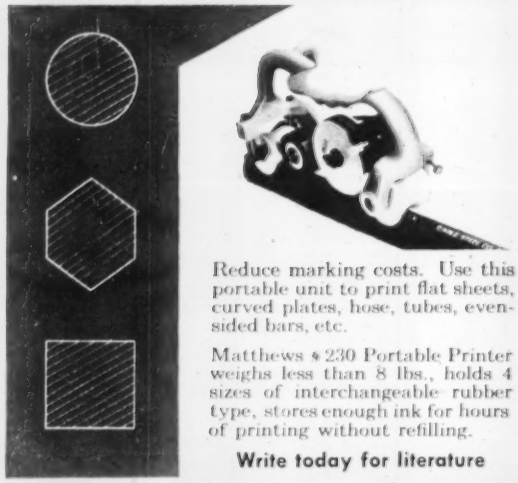

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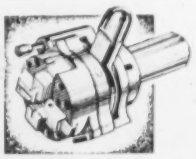

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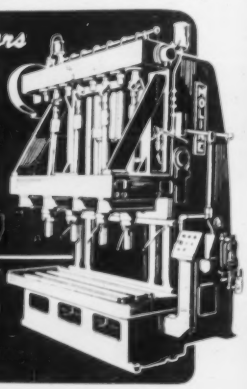

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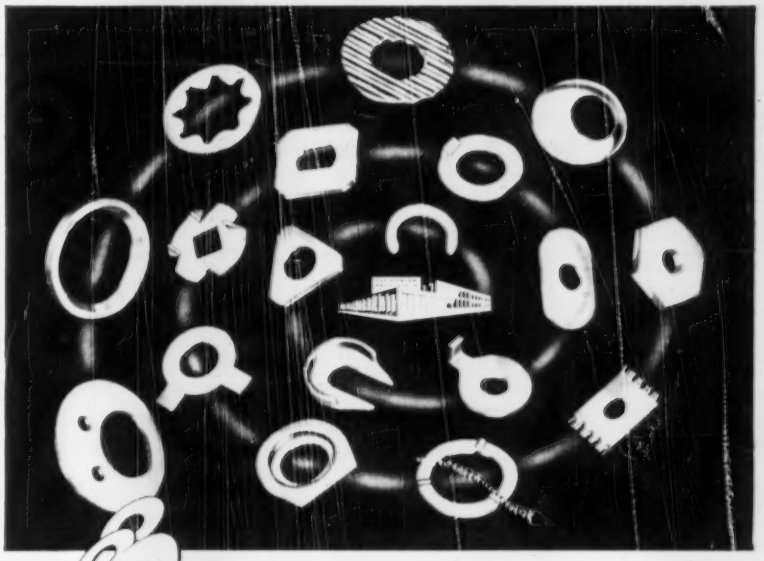

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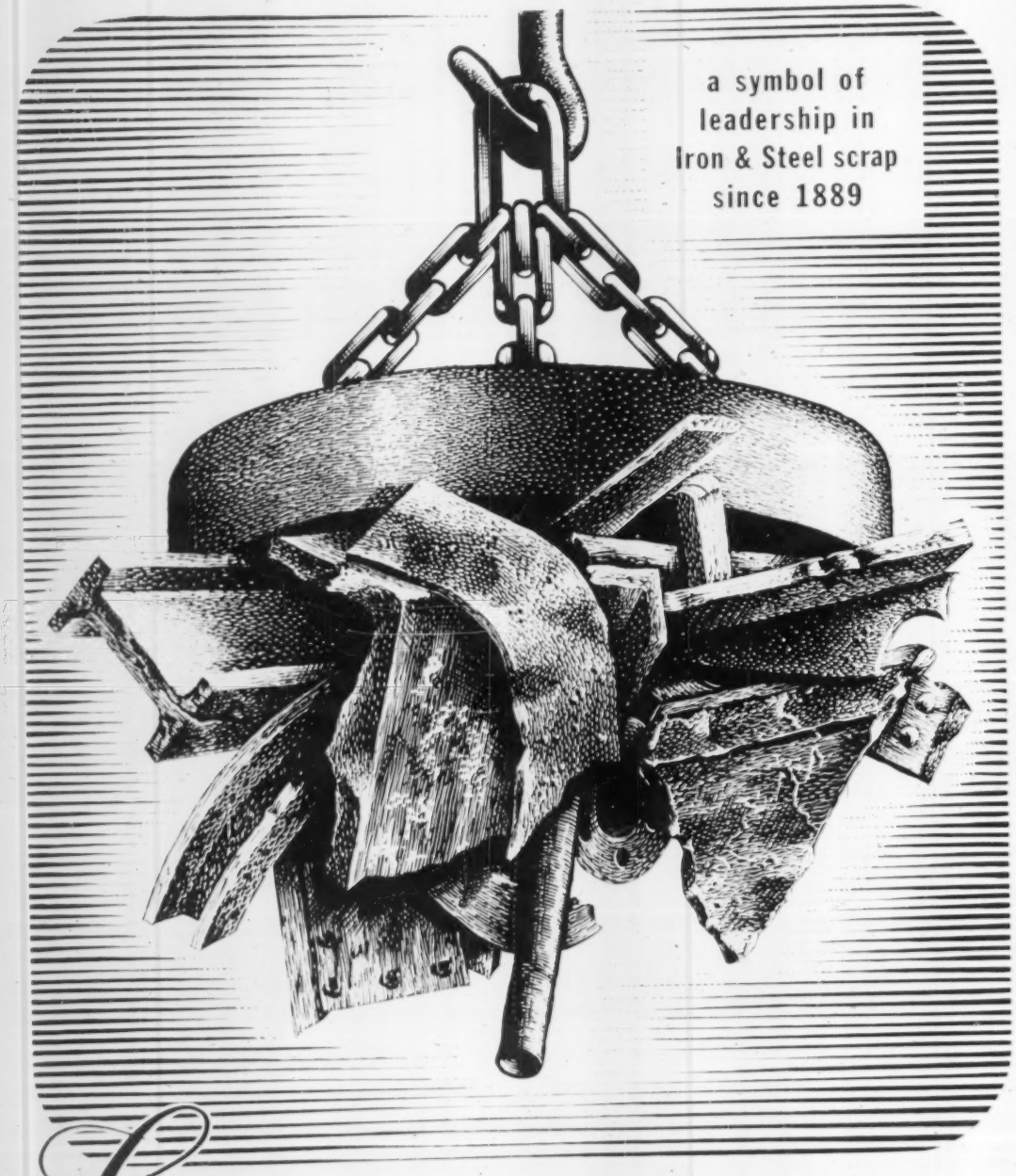

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Scrap Prices Continue To Strengthen

Advance in quotations is expected to be slow due to current large inventories at many consuming points and to comparatively low steelmaking operations

Scrap Prices, Page 164

Chicago—Purchases of open-hearth grades of scrap by a district mill last week moved prices up $1 to $2 a ton. This action formalized prices which brokers had been paying dealers during the previous two weeks.

Purchases included No. 1 heavy melting at $30 for material of industrial origin, and $29 for dealer material, $28 for No. 2 heavy melting, $29 for No. 1 dealer bundles, and $13.50 for machine shop turnings.

Steelmaking operations advanced to 79 per cent of capacity last week but there is some question as to whether this and higher scrap prices are directly related.

Boston—With No. 2 heavy melting and bundles slightly stronger, steel scrap prices have apparently rounded the bend. Recovery in prices is likely to be slow with steelworks' inventories substantial for current and prospective second quarter operations.

Delivered prices at Pittsburgh and other heavier steel producing points have not yet strengthened to point where high freight cost from this area is balanced. Some district consumers are limiting freight to $4 to $5 per ton and getting tonnage within that distance. Cast scrap is steadier on more small-lot buying.

Philadelphia—Steelmaking scrap prices continue unchanged on the basis of light trading. Steadiness also prevails in the cast grades.

Pittsburgh—Rising prices in neighboring areas strengthen sentiment in the scrap market here. This improved outlook is not reflected in larger sales of heavy melting scrap. Increased demand for better grades caused prices of some blast furnace and railroad scrap to rise.

Cleveland—Although large buying of dealer scrap continues absent, the market on steelmaking grades is up about $2 per ton here. The rise is based on small sales and an anticipated spurt in buying with steel operations here tending upward. Improved sentiment, stemming from signs of returning strength at other consuming points, also is a factor. Brokers are encountering difficulty covering their commitments with the dealers confident a strong market is on the way. Some trade interests express the fear that should a sharp upturn in prices develop, steelmakers will be inclined to relight now idle blast furnaces with resulting adverse effect on scrap demand as more hot metal becomes available.

Cincinnati—A large mill in this area has departed from past scrap buying procedures, purchasing from a number of brokers rather than through one broker. This change has temporarily upset prices as brokers compete for business. The Cincinnati market prices remain largely unchanged despite the flurry. One change is indicated in the open hearth grades, an increase on No. 2 bundles by $1 a ton. Transactions in low phosphorus also pushed this item up $1 a ton.

Detroit—Scrap prices here are unchanged, but most market observers are optimistic for the period immediately ahead. One source expects to see a rise of $3 to $4 per ton over the next month. With ingot production slowly rising in the area, and the auto companies busy, chances for a spring upturn look better now than they have in the recent past.

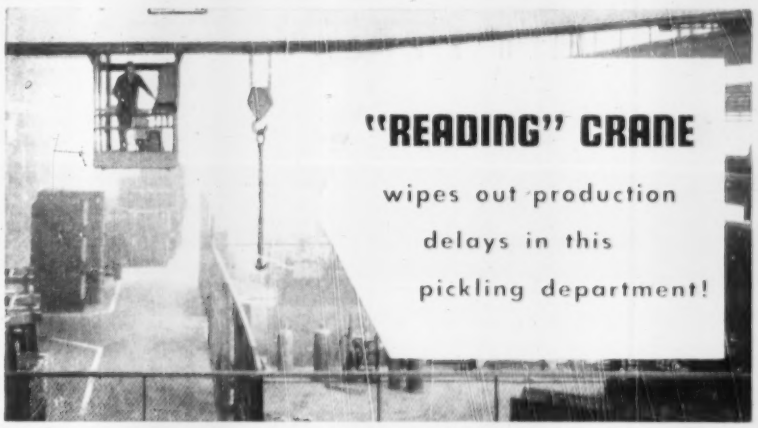
St. Louis—Scrap market awaits an increase in open hearth operations to strengthen demand and prices. Few new orders are being placed. Even the smallest has leverage effect on quotations. A single order in the long dead cast market last week sent heavy breakable cast from $23 to $27 but by brokers. Most prices remain unchanged, however. Dealer receipts have improved for delivery on old orders.

Los Angeles—Steelmaking scrap is starting to move in greater tonnages. Buying of foundry grades is more active. Prices are steady.

San Francisco—Better demand for steel scrap was noted last week, but not enough to affect market prices. Cast grades are firm.

Seattle—There is ample scrap in this area for current needs. Turnover is slow and dealers would welcome export demand for bundles and other surplus grades. Large buyers are well stocked and show little interest. Prices are unchanged.

(*Please turn to page* 166)



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READING CRANES

IRON AND STEEL SCRAP

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Apr 22	$26.00
Apr 15	25.25
Mar Avg	24.37
Apr 1953	42.88
Apr 1949	24.06

Based on No. 1 heavy melting grades at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plants)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	26.00-27.00
No. 2 bundles	22.00-23.00
No. 1 busheling	26.00-27.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	14.00-15.00
Cast iron borings	14.00-15.00
Low phos.	28.00-29.00
Electric furnace bundles	28.00-29.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	29.00-30.00
R.R. specialties	29.00-30.00
Rails, 3 ft. and under	34.00-35.00
Rails, 2 ft. and under	34.00-35.00
Rails, random lengths	33.00-34.00
Rails, rerolling	34.00-35.00

(Cast Iron Grades)

No. 1 cupola	36.00-37.00
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 3 ft. and under	34.00-35.00
Rails, 2 ft. and under	34.00-35.00
Rails, 2 ft. and shorter	34.00-35.00
Rails, random lengths	33.00-34.00
Rails, rerolling	34.00-35.00

(Stainless Steel Scrap)

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	65.00-70.00
430 bundles & solids	65.00-70.00
430 turnings	30.00-32.00

CLEVELAND

(Delivered consumer plants)

No. 1 heavy melting	24.00-25.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	24.00-25.00
No. 2 bundles	17.00-18.00
No. 1 busheling	24.00-25.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	14.50-15.50
Short shovel turnings	14.50-15.50
Cast iron borings	14.50-15.50
Low phos.	28.00-29.00
Alloy free short shovel turnings	14.50-15.50
Electric furnace bundles	24.00-25.00

(Cast Iron Grades)

No. 1 cupola	39.50-40.00
Charging box cast	35.50-36.50
Stove plate	35.50-36.50
Heavy breakable cast	34.50-35.50
Unstripped motor blocks	34.50-35.50
Brake shoes	34.50-35.50
Clean auto cast	40.50-41.50
No. 1 wheels	43.50-44.50
Burnt cast	40.00-41.00
Drop broken machinery	40.50-41.50

(Railroad Scrap)

No. 1 R.R. heavy melt.	39.00-40.00
R.R. specialties	39.00-40.00
Rails, 3 ft. and under	41.00-42.00
Rails, 18 in. and under	43.00-44.00
Rails, random lengths	43.00-44.00
Cast steel	41.00-42.00
Railroad specialties	41.00-42.00
Uncut ties	45.00-46.00
Angles, splice bars	40.00-41.00
Rails, rerolling	40.00-41.00

(Stainless Steel Scrap)

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plants)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	25.00-26.00
No. 2 bundles	20.00-21.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Low phos.	29.00-30.00
Electric furnace bundles	27.00-28.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	29.00-30.00
R.R. specialties	29.00-30.00
Rails, 3 ft. and under	34.00-35.00
Rails, 2 ft. and under	34.00-35.00
Rails, random lengths	33.00-34.00
Rails, rerolling	34.00-35.00

PHILADELPHIA

(Delivered consumer points)

No. 1 heavy melting	22.00
No. 2 heavy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles	23.00-23.50
Machine shop turnings	11.00
Mixed borings, turnings	12.00
Short shovel turnings	16.00*
Structurals & plate	26.00-27.00
Heavy turnings	20.00
Coupled springs, wheels	30.00*
Rerolling rails, 2 ft. & under	44.00

(Cast Iron Grades)

No. 1 cupola	34.00
Malleable	35.00
Heavy breakable cast	30.00-27.50
Unstripped motor blocks	26.00*
Drop broken machinery	41.00

*Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	14.00*
No. 2 heavy melting	12.00*
No. 1 bundles	14.00*
No. 2 bundles	10.00*
Machine shop turnings	4.00*
Mixed borings, short turnings	6.00*
Low phos. structural & plate	20.00
Short shovel turnings	8.00-9.00*

(Cast Iron Grades)

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

(Stainless Steel)

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal

BOSTON

(Brokers' buying prices, f.o.b. shipping points)

No. 1 heavy melting	11.00 Boston
No. 2 heavy melting	10.00 Lynn
No. 1 bundles	13.25-14.25
No. 2 bundles	9.00 Boston
Machine shop turnings	4.00-5.00
Mixed borings, turnings	5.50-6.00
Short shovel turnings	7.25-7.50
No. 1 cast	29.00-30.00
Unstripped motor cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping points)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	18.00-19.00
No. 1 busheling	23.00-24.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-11.50
Short shovel turnings	13.00-14.00
Cast iron borings	14.00-14.50
Low phos. plate	27.00-28.00

(Cast Iron Grades)

No. 1 cupola	35.00
Heavy breakable cast	31.00
Charging box cast	34.00
Drop broken machinery	42.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	28.00-29.00
Malleable	32.00-33.00
Rails, 18 in. and under	42.00-43.00
Rails, random lengths	34.00-35.00

CHICAGO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	29.00-30.00
No. 1 heavy bundles	25.00-26.00
No. 2 bundles	22.00-23.00
No. 1 busheling	29.00-30.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	14.00-16.00
Cast iron borings	14.00-16.00
Low phos. plate	32.00-33.00
Cut structurals & plate	32.00-33.00
Punchings & plate scrap	32.00-33.00
Electric furnace bundles	29.00-31.00

(Cast Iron Grades)

No. 1 cupola	37.50-38.00
Stove plate	34.00-36.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	42.00-43.00
Drop broken machinery	41.00-42.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	30.00-32.00
R.R. malleable	30.00-32.00
Rails, 3 ft. and under	41.00-42.00
Rails, 2 ft. and under	41.00-42.00
Angles, splice bars	36.00-37.00
Rails, rerolling	39.00-40.00

(Stainless Steel Scrap)

18-8 clips & scrap	130.00-140.00
18-8 turnings	60.00
430 clips & scrap	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices, f.o.b. shipping points)

No. 1 heavy melting	17.00
No. 2 heavy melting	15.00
No. 1 bundles	18.00
No. 2 bundles	17.00
No. 1 busheling	18.00
Machine shop turnings	6.50
Mixed borings, turnings	6.50
Short shovel turnings	8.00
Punchings & plate scrap	20.00

(Cast Iron Grades)

No. 1 cupola	36.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	19.50-20.50
No. 1 bundles	23.00-24.00
No. 2 bundles	17.50-18.50
No. 1 busheling	20.50-21.50
Machine shop turnings	14.00-15.00
Mixed borings, turnings	16.50-17.00
Short shovel turnings	17.50-18.00
Cast iron borings	16.50-17.00
Low phos.	27.50-28.50

(Cast Iron Grades)

(F.o.b. shipping point)

No. 1 cupola	34.00-35.00
No. 1 machinery	37.00-38.00

(Railroad Scrap)

Rails, random lengths	33.00-34.00
Rails, 3 ft. and under	40.00-41.00
Railroad specialties	34.00-35.00

BIRMINGHAM

No. 1 heavy melting	19.00-20.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	19.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	19.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	25.00-26.00

(Cast Iron Grades)

(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Bar crops and plate	28.00-29.00
Structural, plate 2 ft	28.00-29.00
Heavy breakable cast	28.00-29.00
Unstripped motor blocks	32.00-33.00
No. 1 wheels	45.00-46.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	23.00-24.00
Rails, 18 in. and under	39.00-40.00
Rails, random lengths	32.00-33.00
Angles, splice bars	35.00-36.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	25.00
No. 2 heavy melting	23.00
No. 1 bundles	25.00
No. 2 bundles	19.00-20.00
Machine shop turnings	10.00-11.00
Short shovel turnings	12.00-13.00

(Cast Iron Grades)

No. 1 cupola	37.00
Charging box cast	27.00
Heavy breakable cast	27.00
Unstripped motor blocks	26.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	29.00

(Railroad Scrap)

No. 1 R.R. heavy melt.	29.00
Rails, 18 in. and under	38.00
Rails, random lengths	34.00
Rails, rerolling	37.00
Uncut ties	30.00
Angles, splice bars	32.00

SEATTLE

(Delivered consumer plants)

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.00
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

(Cast Iron Grades)

(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

(Railroad Scrap)

(Delivered consumer plants)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

(Cast Iron Grades)

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	50.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Machine shop turnings	5.00

(Cast Iron Grades)

(F.o.b. shipping point)

No. 1 cupola	30.00

HAMILTON, ONT.

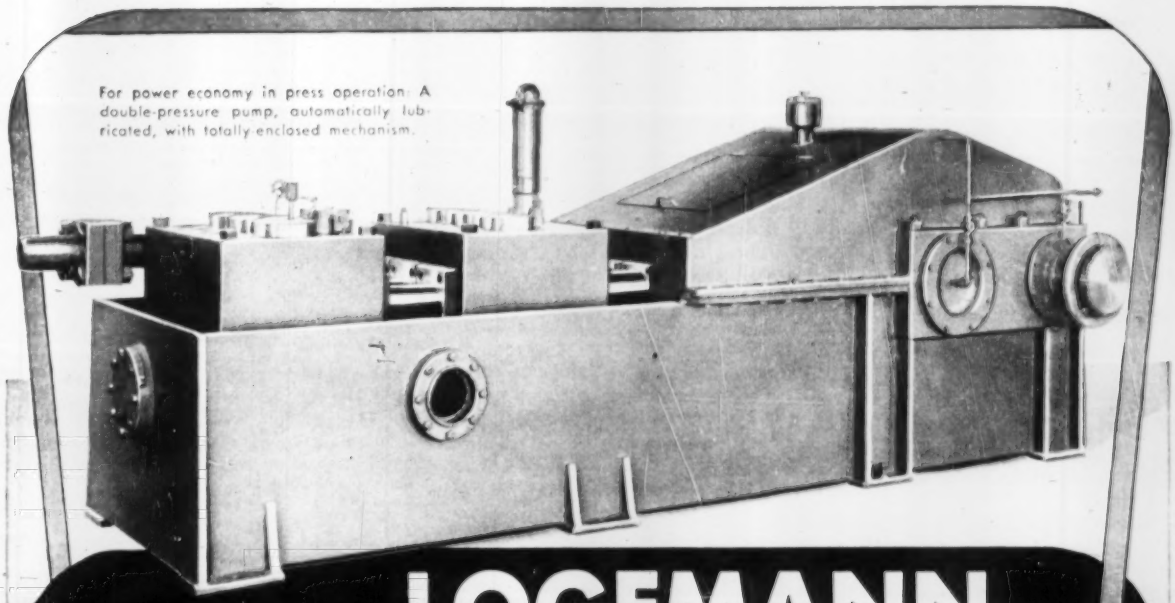
(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory	
Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

(Cast Iron Grades)

No. 1 machinery cast	42.00-45.00

(F.o.b. shipping point)



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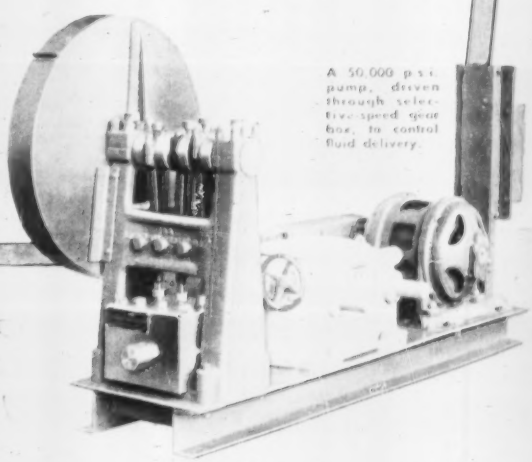

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(Concluded from page 163)

Record full cargo scrap charters were closed: Los Angeles to Japan at $89,000 and Honolulu to Japan $82,000.

Washington Consumption of ferrous materials (scrap and pig iron) during February was the lowest, except for strike months, since February 1950, reports the Bureau of Mines. Total furnace charge of 8,679,000 gross tons, comprising 4,385,000 tons of scrap, and 4,294,000 tons of pig iron, was the smallest since September 1949 and March 1950, respectively.

Scrap for consumption in February was 4,177,000 gross tons, 3 per cent less than in January. Home scrap accounted for 2,714,000 tons, and purchased scrap 1,763,000 tons.

Stocks of scrap held by consumers decreased for the second consecutive month despite the reduced consumption rate. The 2,526,000 gross tons of pig iron stocks held by consumers and suppliers was 2 per cent above December and established a new all-time high. Scrap supplied 51 per cent of the total charge of ferrous materials in February, the highest proportion of scrap in 8 months.

Comparative scrap data follow:

SCRAP FOR CONSUMPTION
(Gross Tons)

	Purchased		
	Home Scrap Produced	Scrap Received	Total
1953			
September	2,520,401	2,291,595	4,812,496
October	3,294,223	2,110,963	5,405,186
November	3,100,179	1,969,029	5,069,208
December	3,089,311	1,889,256	4,978,567
1954			
January	2,560,000	1,547,419	4,107,419
February	2,714,000	1,577,000	4,291,000

CONSUMERS' STOCKS (End of Month)
(Gross Tons)

	Scrap	Pig Iron
1953		
September	6,271,831	2,241,230
October	6,064,429	2,256,041
November	6,063,447	2,476,052
December	6,583,191	2,500,329
1954		
January	6,253,580	2,467,579
February	6,197,000	2,526,000

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 151

Philadelphia Following the reduction in oven coke price at Swedeland, Pa., recently, the Philadelphia producer has lowered its price to the same level, $23 ovens. This is a cut of 95 cents per ton as against 85 cents by the Swedeland interest.

Finished Steel Shipments Decline

Drop of 18.4 per cent in first two months of this year from the like period a year ago contrasts with a decrease of 20 per cent in ingot production. Builders take more

New York Direct shipments of finished steel to the construction industry in January and February increased as compared with the like two months of last year, reports the American Iron & Steel Institute.

Shipments to other industries, however, decreased. Total in the two months amounted to 11,092,441 net tons, or 2.5 million tons less than in the corresponding period of 1953.

The drop of 18.4 per cent in shipments during the period contrasted with a decrease of 20 per cent in ingot production in the two months.

In February shipments totaled 5,361,978 tons, and in January, 5,727,463 tons.

The construction category received 761,000 tons in February and nearly 1,539,000 in January-February combined. The latter total was an increase of more than 9000 tons over the 1953 like period. Steel shipments to construction in all of 1953 were record-breaking.

Shipments of steel to the container industry in February, at 172,000 tons, were 5000 tons more than a year earlier. The automotive industry take decreased in February to 997,000 tons, and totaled about 2.1 million tons in the first two months of the year, 11 per cent lower than in the corresponding period of last year.

Shipbuilding, oil-drilling and agricultural equipment all took larger tonnage in February than in January. Shipments of 1.9 million tons to warehouses in January-February were 25 per cent less than in the year earlier, the decline reflecting liquidation of inventories.

Shipment data for February are shown in the accompanying table.

Semifinished Steel . . .

Semifinished Prices, Page 138

Chicago Although steelmaking operations bounced back to 79 per cent of capacity last week, 2.5 points better than the actual rate of the preceding week, not all of the gain is traceable to better order volume. Some of the advance represents the bolstering of inventories of slabs, billets and blooms which recently were reduced too drastically and interfered with rolling schedule flexibility. One large mill, making steel at full capacity, states 8 to 10 per cent of its ingots are earmarked for semifinished inventory buildup.

SHIPMENTS OF FINISHED STEEL—FEBRUARY
(Net Tons; all grades)

Products	Carbon	Alloy	Stainless	Total
Plates	326,853	12,947	1,681	341,481
Plates, sheets, etc.	191,260	20,171	1,020	212,451
Sheets	1,533,553			1,533,553
Wire, rods	51,903	1,603	380	53,886
Shapes, heavy	135,405	2,501	10	137,916
Steel piling	29,064			29,064
Rails, standard	168,834			168,834
Rails, other	8,926			8,926
Joint bars	4,490			4,490
Tie plates	29,632			29,632
Wheels	23,526	75		23,601
Track spikes	7,161			7,161
Axles	6,771	7		6,778
Pipe, shot (cast)	12,066	120,600	2,967	135,633
Bars, merchant	112,505			112,505
Bars, cold finished	82,527	13,784	3,172	99,483
Tool steel	1,137	6,294		7,431
Standard pipe	162,114	2	5	162,121
Oil country goods	210,437	18,655		189,092
Line pipe	223,692			223,692
Mech. tubing	16,408	13,207	400	62,015
Pressure tubing	21,547	4,127	1,811	27,485
Wire drawing	168,963	2,710	1,341	172,976
Nuts & bolts	41,041		2	41,046
Wire, clothed	13,561			13,561
Woven fence	20,850			20,850
Barb wire	2,216			2,216
Rivets	51,405			51,405
Tin mill black plate	6,586			6,586
Tin plate, coated	297,169			297,169
Sheets, cut, coated	487,937	12,610	927	501,474
Sheets, mill, black	760,760	4,805	6,051	771,616
Sheets, galvanized	167,433			167,433
Sheets, other coated	12,398			12,398
Sheets, culverts	13,280			13,280
Sheets & strip, electrical	41,826	11,831		53,657
Strip, cut, coated	114,477	1,477	190	116,144
Strip, mill, black	98,147	904	12,982	112,033
Total	3,917,246	242,771	31,761	4,191,778

...if only for THEIR sakes

...learn how to protect yourself from death from cancer. They need *you!*

And for your sake and theirs you must keep on remembering that the best cancer "insurance" is:

FIRST...*to make a habit of periodic health check-ups no matter how well you may feel, always including a thorough examination of the skin, mouth, lungs and rectum and (for women) the breast and genitative tract.*

SECOND...*to learn the seven danger signals that may mean cancer, and go straight to the doctor at the first sign of any one of them: (1) Any sore that does not heal (2) A lump or thickening, in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.*

For other life saving facts about cancer, phone the American Cancer Society office nearest you, or address your letter to "Cancer" in care of your local Post Office.

American Cancer Society

CLASSIFIED

Help Wanted

METALLURGIST

Excellent opportunity for young man with medium size manufacturer of power plant equipment. Wide variety of problems in ferrous and nonferrous metallurgy, some welding of steel. Salary experience helpful. Reply Box 948 STEEL, Penton Building, Cleveland 13, Ohio.

ASSISTANT TO PRESIDENT of large midwestern manufacturer located in East with experience in manufacture of heavy machinery, shop administration, technical background and ability to embrace larger responsibilities such as works manager. Full details please which will be held in strict confidence. Reply Box 941 STEEL, Penton Building, Cleveland 13, Ohio.

MAN WITH GENERAL FORGE SHOP EXPERIENCE to train and supervise forge shop supervisors and operatives personnel in proper practice of forge shop equipment and production practices in preparation of operation sheets. Drop forging experience not essential. Foreign assignment. Submit full resume in confidence. Reply Box 962 STEEL, Penton Building, Cleveland 13, Ohio.

HELP WANTED

Stainless Producer seeking Sales Representative with Metallurgical training. Applicant must have good knowledge of Metallurgy and will have exclusive sales territory if accepted. All replies held confidential. Give full particulars. Interviews can be held in New York, Chicago or Cleveland. Address Box 957 STEEL, Penton Building, Cleveland 13, Ohio.

Accounts Wanted

DIRECT REPRESENTATIONS WANTED. Established manufacturers agency contacting steel mills, fabricators and miscellaneous industrials in eastern Middle Atlantic area increasing sales force and wants to add one or two new lines. Reply Box 960 STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

PLANT MANAGER—M.I.T. Engineering Graduate with Proven Record in Supervision, Production, Tooling, Cost Reduction, Methods Improvement and Related Functions. Reply Box 949 STEEL, Penton Building, Cleveland 13, Ohio.

INDUSTRIAL SALESMAN, 29, Philadelphia, 10 State Institute, seeks similar post. Wide industrial experience, steel, iron, coal, power. Also industrial distributor. Engineering background. Desires opportunity $7,000 income. Reply Box 963 STEEL, Penton Building, Cleveland 13, Ohio.

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Chicago 23, Illinois
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New York 7, New York
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OF WASHINGTON

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ACID Saves STEEL MONEY

Use "RODINE" for improved pickling and increased production!

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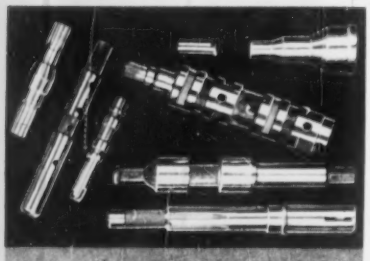

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Ottawa
STEEL PRODUCTS INC.
Grand Haven Michigan

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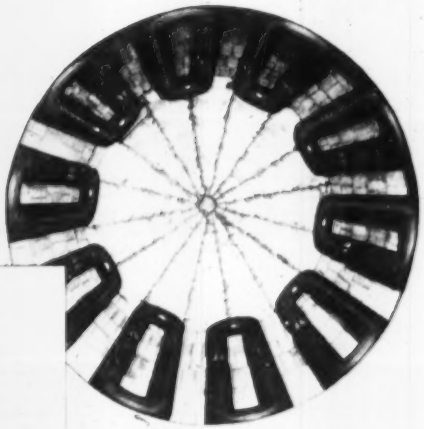
here's the amazing "O" tube

that reduced annealing costs



The remarkable efficiency of the Lee Wilson Single-Stack Portable-Base Annealing System is due in a great degree to the new "O" type radiant tube. The tube, developed by Lee Wilson especially for the bell type furnace, is an engineering accomplishment.

The design of the tube allows greater length of flame travel and the fuel application is so arranged that the principal heat release is in the bottom of the tube. The flame, however, is continued around the top elbow, changing the direction of the gas flow, keeping the primary combustion near or on the tube surface, effecting more efficient heat transfer. The sharp turns designed into the tube not only make it a compact, space-saving unit but create a gas turbulence at the elbows that promotes more rapid combustion; thus, more of the tube is working. The "O" Tube has a much greater dispersion area than other tubes and can operate at an input of 500,000 BTU per tube, per hour.

The design of the tube also permits perfect blanketing of inner cover, speeding heating time and eliminating hot and cold spots. Structurally, the tube has the advantage of not requiring holes in the furnace arch and but one opening in the side wall. It is free to expand in every direction, preventing excessive force which might crack the joints.

There's a lot more to the story! Performance records prove this tube has no equal when it comes to quality production annealing. It's the furnace of the future — here today. Brochure and data sheets available upon request.

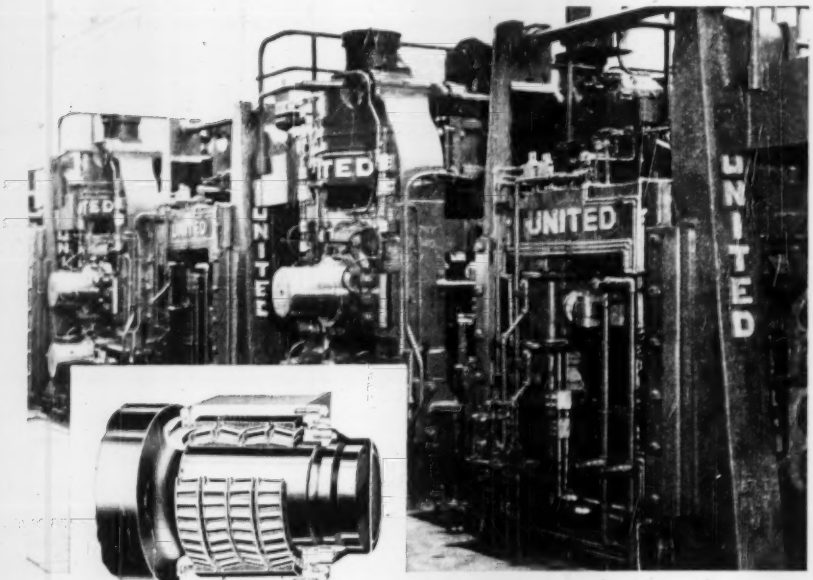
Lee Wilson

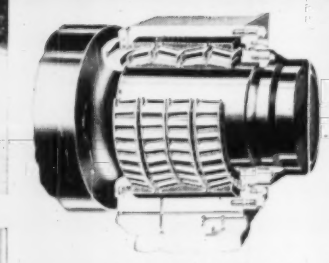
ENGINEERING COMPANY, Inc.

20005 WEST LAKE ROAD, CLEVELAND 16, OHIO

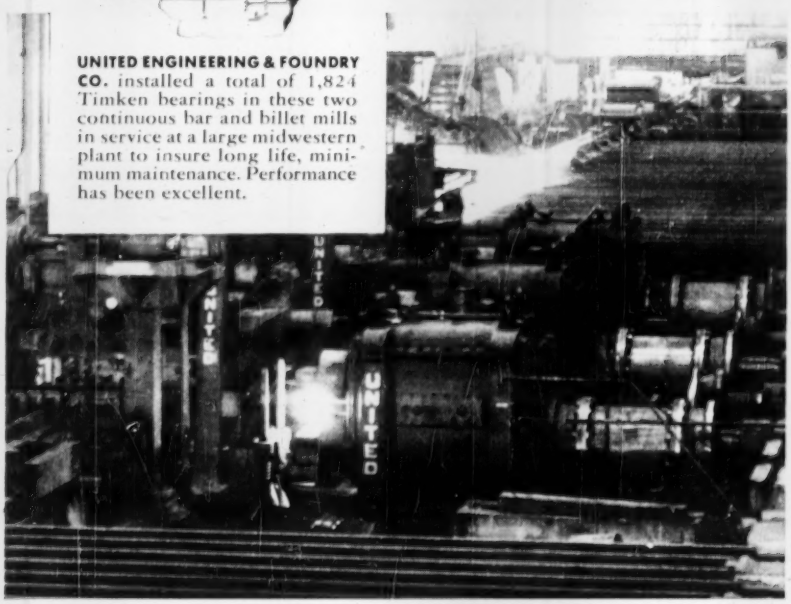
1,824 TIMKEN® bearings in two United mills!

Result: *constant pass alignment, simplified lubrication*





UNITED ENGINEERING & FOUNDRY CO. installed a total of 1,824 Timken bearings in these two continuous bar and billet mills in service at a large midwestern plant to insure long life, minimum maintenance. Performance has been excellent.



SEVERAL years ago, United Engineering built these two modern high-speed 20" x 36" and 30" x 48" continuous bar and billet mills with alternate vertical and horizontal stands for a big midwestern steel producer. All told, they used *1,824 Timken® tapered roller bearings* in the two mills—on the roll necks; in the drives; on the run-out tables and in other vital applications.

Timken roll neck bearings permit maximum roll neck size and provide greater mill rigidity. Higher rolling speeds are possible. Mills can be started or stopped without loss of steel. Pass alignment is accurately maintained by Timken roll neck bearings *without* the use of auxiliary thrust bearings. Due to their tapered construction, Timken bearings take radial and thrust loads in any combination.

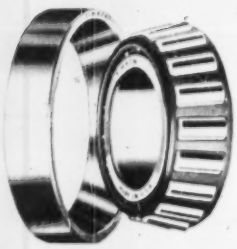
With Timken bearings there are no complex lubrication systems for roll neck bearings. They use simple economical grease lubrication. This eliminates a possible source of trouble, speeds up roll changes, reduces maintenance.

Here are more significant bearing facts to consider: Timken bearings have extremely low frictional resistance due to their true rolling motion and *incredibly* smooth finish. They have extra load carrying capacity due to full line contact between rollers and races. They hold shafts and housings concentric, making closures more effective; dirt stays out, lubricant stays in.

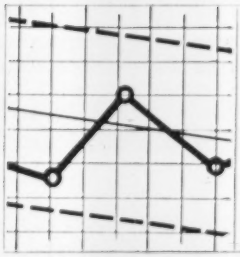
When you buy equipment, look for Timken bearings. When you build equipment, look into Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian Plant: St. Thomas, Ont. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.



TAPERED ROLLER BEARINGS



STATISTICAL QUALITY CONTROL

To insure uniform high quality and closer tolerances, the Timken Company uses statistical quality control. With it, tolerance deviations are plotted graphically. It's one of industry's newest, most scientific methods of improving product uniformity.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION